RELATIONSHIP BETWEEN ORGANISATIONAL CULTURE AND KNOWLEDGE CREATION PROCESS IN KNOWLEDGE-INTENSIVE BANKS

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Dedicated to my wife Bina Salman for her endless support and motivation

My gratitude is extended to my Aboo and Amee for recognising my abilities. Undoubtedly, their prayers gave me the strength without which it would not have been possible to accomplish this endeavour. I am also indebted to Baba Kamil and Sain Faiz Muhammad for their love, encouragement and prayers.

Abstract

Deployment of knowledge as a factor of production appeared to be a 'centre of gravity' for management science researchers from which the organisational strategy and policy of knowledge 'exploration' and 'exploitation' is likely to be devised in the new knowledge economy. Nonaka and Takeuchi's knowledge creation process model provides a distinctive framework in management and organisation studies that broadly covers the knowledge sharing and creation process. The process of organisational knowledge creation in Japanese and Western organisations is thoroughly investigated. In spite of the 'universal applicability' of the SECI model as acclaimed by Nonaka, no such research has been carried out in any of the developing countries like Pakistan. Also, in spite of the recognition of the influence of culture on effective knowledge management implementation, knowledge management practices, and knowledge sharing, management and transfer the relationship between organisational culture and specific knowledge management processes were not investigated. This thesis contributes to the body of knowledge management literature on the relationship between organisational culture and knowledge creation process based on socialisation, externalisation, combination, and internalisation. A sample was drawn from 50 branches of three knowledge-intensive commercial banks in Karachi. Before examining the hypothesised relationship between organisational culture and knowledge creation processes based on 'internally focused' and 'externally focused' organisational culture factors, the separate confirmatory factor analysis provided the evidence of the latency of both knowledge creation and organisational culture constructs developed by a researcher using IBM AMOS v19. Results indicate that, in terms of 'internally focused' culture, the result have improved our perspective of the knowledge creation process in the context of an organisation that has the ability to keep focusing on the internal integration of systems, structures, and processes through employee and customer satisfaction. Moreover, in terms of 'externally focused' culture, the result have improved our perspective of the knowledge creation process in the context of organisations that keep focusing on adapting and changing in response to the prevailing environmental threats and opportunities.

Keywords: SECI, knowledge creation, organisation culture, mixed-methods study, knowledge-intensive Pakistani banks, confirmatory factor analysis (CFA), structural equation modelling (SEM), inductive content analysis.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Over the past two decades, knowledge management materialised as a separate field of management science research (Nonaka and Konno, 2005; Kao et al., 2011, Rai, 2011). In knowledge creation theory, organisational culture as an antecedent is not assumed. Although, it is generally acclaimed that culture (i.e. in a different context) is a function of knowledge creation (Haag et al., 2010). In order to make the assumption that culture can be a primary antecedent of knowledge creation, we need to look at the nature of both the culture and knowledge creation process. Despite recognition of the influence of culture on effective knowledge management implementation (Janz and Prasarnphanich, 2003), knowledge management practices (Alavi et al., 2006) and knowledge sharing, management and transfer (Schumann and Tittmann, 2010), the relationship between organisational culture and specific knowledge management processes is not investigated (Mueller, 2012). In management and organisation studies, Nonaka's SECI model of knowledge creation provides a distinctive framework that broadly covers the sharing and creation process (Von Krogh et al., 2000a; Earl, 2001). Therefore, the principal aim of this mixed-methods study investigates the hypothesised relationship between organisational culture and the knowledge creation process based on socialisation, externalisation, combination, and internalisation in Pakistani knowledge-intensive banks.

Although, a mixed-methods approach that used both quantitative and qualitative data was adopted in the knowledge management empirical studies, there are no such widely accepted models that test the causal relations using a combination of statistical data and qualitative causal assumptions. This study seeks to plug-into the potential gap by providing structural equation models (SEM) using both confirmatory and exploratory modelling for theory testing and theory development of organisational culture and knowledge creation. For theory testing, a confirmatory factor analysis (CFA) was employed to test the validity of selected variables through the adequacy of the hypothesised factor structure. For theory development, a path

analysis was applied in the structural part of SEM in order to test the hypothesised causal relationships between organisational culture (exogenous variables) and knowledge creation (endogenous variables). Meanwhile, a qualitative method is employed to investigate the core issues related to the policy framework of Pakistani commercial banks from an organisational culture and the knowledge creation strategy perspective by interviewing both senior management and HR heads. This chapter offers a concise introduction of the study. Section 1.2 describes the motivation of the study followed by the organisational need for knowledge creation which is summarised in Section 1.3. Section 1.4 explains the significance of the study before summarising the key definitions in Section 1.5. However, Section 1.6 contains the thesis structure.

1.2 Motivation of Study

For any country or organisation, knowledge is the foundation required for survival and development. In the knowledge economy, knowledge is the main input for companies in which workers deal with information rather than things (Shih et al., 2010). Thus, an appropriate understanding of how to materialise knowledge management strategies is crucial (Shih et al., 2010). However, the lack of effective application of knowledge in the manufacturing and production processes is accelerating the economic divide between developed and developing countries (Akhtar, 2001; Jamal and Naser, 2003). Existing global business activities are becoming more knowledge-intensive as knowledge is becoming the source of productivity within and across economies. More specifically, any organisation could be three times more productive, if it 'knew what it knows' (Tsai and Li, 2007). The creative people are indispensable regardless of whether the organisation is public or private, and providing services or manufacturing goods. Apart from this, the role of knowledge workers in the rapidly changing knowledge economy is also more complex and vibrant. Hence, the current development within the field of knowledge management has grown in its importance of organisational and economic perspective.

The dynamic business environment, technological advancement, top and bottom line product or service competitiveness, cultural diversity and growing customer demands are a few of the constraints that switch knowledge creation and management as a prerequisite (Egan, 2005). Thus, the application of knowledge has advertently reformed the traditional ways of doing business, in which knowledge management is seen as an important intangible asset for enhancing business effectiveness (Rowley, 2001).

In the case of developing countries, the knowledge-based economy on the one side unfolded numerous opportunities, while it exacerbates the problems on the other side such as a developing country like Pakistan which is contending against poverty, unemployment, political instability, energy crisis and the fight against terrorism. However, it is undeniable that a large number of public and private sector organisations in Pakistan hitherto are not involved in managing knowledge for gaining a competitive advantage and long-term success. The advent of globalisation has brought noteworthy changes to the work-related values of public and private sector organisations in Pakistan which reflects a modern market economy (Khilji, 2003; 2004). Despite increasing competition, Pakistani organisations experience a variety of structural and institutional irregularities which diminish their capabilities in order to seize full advantage of the rapidly changing environment of globalisation (Bhatti and Qureshi, 2007). In 1990, a privatisation programme was initiated to restructure the bureaucratic culture and poor human resource practices (Mirza, 1995). Through this denationalisation process, an attempt has been made to induce modern management practices and eliminate bureaucratic culture of the organisation to some extent (Khilji, 2003). Particularly, the privatisation process enkindled the soul into poor management practice especially employees working in Pakistan banking organisations who were encouraged to share their ideas but not given the authority to speak their minds in the decision making (Khilji, 2003).

Apart from the power distance management approach, the global financial crisis has shifted a competitive fringe of banks as it inflates customer conciseness about products and services (Akdag and Zineldin, 2011). Therefore, there was a consensus

developed to capitalise on the developmental benefits of resources and to leverage the knowledge as an important factor of production (Arner and Schou-Zibell, 2011). The recent economic meltdown also transformed the institutional discourse towards a highly skilled knowledgeable employee who is more responsible for economic growth through greater creativity and productivity (Hall, 2009). Therefore, in response to the changes in the global environment, Pakistani organisations underwent through dramatic changes and thus adopted the American models of managing organisations (Khilji, 2003).

Furthermore, the global economic crisis has firmly focused the spotlight on not only the corporate culture of the financial services sector but business corporate culture in general. Several recent events have created a belief that corporate culture is a factor in business that we should be wary of; and yet, a positive corporate culture and environment can be a driver for knowledge exchange, knowledge creation and growth. It is inevitable that the knowledge could be used to overcome economic disparities; whereas it is an open question whether organisational culture can be used to leverage knowledge creation capability. Despite that, various empirical studies validated this correlation, and also attempts are being made to understand this phenomenon. However, previous research studies are few and limited in design. Therefore, keeping in view the theoretical and empirical importance, the objective of this quantitative-driven mixed-method research is to investigate plausible relationships between organisational culture and knowledge creation process in knowledge-intensive banks in Pakistan.

1.3 Organisational Needs for Knowledge Creation

The term ‘knowledge-based economy’ typically derives from the recognition of the role of knowledge and technology in economic development (Kefela, 2010). The knowledge-based theory of the firm regards knowledge as an important resource for economic development (Foray and Lundvall, 1996). Precisely, the personified nature of knowledge resources is normally difficult to impersonate. Knowledge workers are high level employees who apply abstract and systematic knowledge that is obtained during formal education in developing new products or providing services (Drucker,

1998). In other words, the knowledge workers in the shape of engineers, managers, analysts, bankers, designers, doctors, and researchers add economic value through their knowledge to achieve sustained competitive advantage in products and services (Florida, 2010).

Historically, the deployment of knowledge as a factor of production and source of competitive advantage is not new. The distinguished economists, for example, Adam Smith (i.e. wealth of nations*)*, Alfred Marshall (i.e. knowledge as a productive resource) and Kenneth Arrow (i.e. learning by doing) also cited 'knowledge' as a source of competitive advantage and economic production (Ichijo, 2006). The inception of the term 'knowledge worker' paved another milestone in the field of management (Drucker, 1998). Undeniably, Peter Drucker's theory of the 'knowledge economy' meticulously shifted the conventional patterns of economic growth by highlighting the value of the knowledge worker (Florida, 2010).

Until the 1990s, economists kept on finding the basics of economic growth (Foray and Lundvall, 1996). In this limelight, corporate investment for deploying knowledge resources in response to the apparent changes in the larger economic environment not only enhances the productive capacity of the firms, but it also manages knowledge-based competence of the corporation in collaboration with other factors of production (Ichijo, 2006; Florida, 2010). However, the definition of success for organisations was transformed in the global knowledge economy in which knowledge became a commodity and constituted a competitive advantage (Friedman, 2007; Florida, 2010). Hence, the deployment of traditional production functions that merely comprised of the land, labour, capital and raw materials were replaced with knowledge and intellectual capital through knowledge creation and sharing on a global basis (Ichijo, 2006). For example, a significant number of people acquired employment in the knowledge category over the past three decades (Florida, 2010). The approximate share of knowledge workers drastically increased in the United States from 17% to 59% in 2000 as compared to non-knowledge workers, whose share had drastically declined from 83% in 1990 to 41% in 1998 (Meister, 1998). In addition, only in the United States, the knowledge workers (or knowledge sector)

accounted for almost 50% of all wealth generation. With regard to that, the total manufacturing and service sector contributed nearly $2 trillion to the economy and more than half of all wages and salaries were paid to the knowledge sector other than the manufacturing and service sectors (Florida, 2010).

Moreover, the knowledge-based theory of the firm fundamentally stands on the assumption that the critical input for production and creating value is knowledge (Grant, 1996). Production processes require the conversion of inputs (e.g. land, labour and capital) into outputs (e.g. product and service) (Florida, 2010). However, economists have long thought to redefine the French Physiocrats' land-based theory of value and introduced a knowledge-based theory of the firm (Grant, 1996). It is, however, acknowledged that all human abilities are knowledge dependent. Knowledge provokes all humans to create new ideas, concepts, mind maps and different cultural norms and practices. Therefore, organisational knowledge vis á vis employee knowledge really matters to obtain a sustained growth and a competitive advantage (Florida, 2010). Arguably, this idea is backed up with some previous thoughts which entail that the internal resources, capabilities, and competencies of the firm, such as knowledge, learning, and dynamic capabilities, have become sources of long-term sustainability and competitive advantage (Pfeffer, 1995).

The resources of knowledge are bounteous because they are neither easily transformed nor easily created in a meaningful ways (Grant, 1996; Foray and Lundvall, 1996). Therefore, the rate of knowledge utilisation in an average economic production process is still a very complex phenomenon. Alternatively, a non-physical type of factor of production also disregards some primary economic principles and most people in the creative group do not hold and manage their intangible resources effectively because it literally has remained in their heads (Florida, 2010). It is, therefore, quite indispensable to synthesise, enhance, and expedite large scale inter and intra firm knowledge management application (Alavi and Leidner, 2001).

In the knowledge management literature, different knowledge management categories are widely cited that seem indispensable for knowledge-intensive

organisations in the knowledge-based economy. For instance, four categories of knowledge (know-what, know-why, know-who and know-how) are widely acknowledged. The conceptual and categorical understanding of these categories deem important in order to comprehend a knowledge economy interlink. Know-what and know-why categories of knowledge are treated generally as an economic resource and are practically easy to codify and measure as an economic production function. In contrast, know-how and know-who usually come into the category of tacit knowledge. Therefore, it is rather difficult to codify and measure this category (Lundvall and Johnson, 1994).

Categorically, know-what, refers to the knowledge about the facts and ground realities based on available information. This knowledge is normally required to perform basic job functions depends upon the job functions to be performed. For performing complex job functions, people require a lot of know-what type of knowledge as compared to performing less complex job functions that merely require a little know-what knowledge about problems. As, know-why category of knowledge involves scientific knowledge; e.g. laws of nature, economic principles and management philosophies. This type of knowledge is most important for accomplishing technological development and product and service advancements especially in most knowledge-intensive organisations. However, this kind of knowledge can only be accessed through the interaction of explicitly trained employees or individuals in joint activities. It can also be widened through a community of practice consisting of a closely knit group of people who are engaged (wittingly or unwittingly) in a communal practice; they know each other, work together and typically communicate with each other in an unswerving manner (Wasko and Faraj, 2005). In addition, know-why is a specialised category of knowledge which is, acquired, created and transformed only in specialised organisations.

From an economist's point of view, the know-who category of knowledge is also important because it refers to information about ‘who knows what’ and ‘who knows how to do what’. For example, this information helps organise members to constitute

communal relationships, which make it practicable to keep the knowledge flowing more efficiently in dynamic business continuity. Foray and Lundvall (1996) advocated that know-who type of knowledge is internal to the organisation to a higher level than any other kind of knowledge. Therefore, it is vital to apply the know-who category of knowledge in response to different market forces especially where the skills and abilities are widely dispersed and in order to meet various global and local challenges; for example, competition, technology, supply and demand conditions.

Knowledge know-how is related to human skills and abilities. Economists argue that know-how characteristically is a kind of knowledge that can be developed within an individual firm or industry. Therefore, it is acquired, created and transformed only in a delimited space, area or location. Knowledge know-how helps managers, employees, and individuals to forecast market trends or industry patterns to develop business strategies, plans and policies. Hence, business networks and industrial relationships are deliberately structured to share elements of know-how. In this respect, Wasko and Faraj (2005) argue that joint sense-making and problem-solving practices foster the formation of strong interpersonal skills and will create norms of direct reciprocity within a small community. Therefore, it enables organisations to increase knowledge know-how and sense of reciprocity between members.

It emphasised that, knowledge management becomes a prerequisite for public and private organisations for a gaining competitive advantage (Rai, 2011). Therefore, organisations need to adopt a knowledge management system so as to attain competitiveness among the fast-paced companies of the twenty-first century (Quinn, 1992; Christopian, 2008). Similarly, knowledge acquisition, knowledge dissemination, knowledge transformation and knowledge creation are the key strategic resources for knowledge-intensive organisations to achieve a competitive advantage (Wiig, 1997). Therefore, managers should realise effective ways in which they can leverage knowledge that exists within their own organisation (Swart and Harvey, 2011). More specifically, the industrial revolution has shifted the organisational paradigm towards utilising knowledge as a fourth factor of production

so as to contend unsure global continuum. Thus, knowledge creativity has been given credence as organisations acknowledge the advantage of integrating knowledge-based creative resource to their reciprocated profit (de Jong et al., 2010). Moreover, the knowledge management system is not only useful for the service and process improvement, but it also develops a centralised communication system within the entire banking industry (Kridan and Goulding, 2006). In the services' sector, (especially in the banking industry) 'knowledge creation', 'knowledge sharing', 'knowledge acquisition' and 'knowledge integration' might accelerate the competitive fringe of the business opportunities. Therefore, knowledge management practice within the banking industry is considered as a source of connecting people, processes and technology (Alrawi and Elkhatib, 2009).

1.4 Significance of Study

The significance of this study for banks within the context of changing patterns of the global knowledge economy and the prevailing threat of the financial crisis is, however, multifaceted. For example, Holland (2010) firmly holds that the bank-centred financial crunch of 2007-2009 was caused due to knowledge gaps because of a lack of banking knowledge and the inability of the top management to timely address the knowledge gap and thereby made it more eccentric (Turner, 2009). However, the materialisation of banking knowledge offered a sustainable solution to the pre- and post-financial crisis issues as it expedited the banking organisational arbitration and risk management process (Holland, 2010).

During the financial meltdown, most of the insolvent banks either overlooked the value of existing knowledge in business operations or ignored the impetus of knowledge creation, sharing and use which can be considered to deal with the problems aroused by the financial crisis (Holland, 2010). In other words, only considering the financial grounds for finding the reason of the banking sector meltdown while neglecting knowledge capital from this crisis was not only unwarranted, but also an inadvertence from the likelihood of future events (Turner, 2009). Furthermore, financial analysts are strongly convinced that the banking failure was informational rather than financial because top management failed to figure out

the knowledge gap in terms of their business strategies. In this connection, a causal comparison during the crisis showed that the rate of survival was relatively high in knowledge-intensive banks compared to non-knowledge-intensive banks (Holland, 2010). For example, Holland (2010) developed a theoretical framework to investigate how knowledge can formally create, manage and penetrate into banks during a time when more organisational arbitration is needed for suitable risk management. It is advocated that the continuous processes of learning and organisational knowledge management alone trickles down the chances of bank failure (Turner, 2009). Thus, it seems indispensable to establish a framework to understand how financial institutions, especially banks, robustly create new knowledge in order to sustain financial shocks and attain a competitive advantage (Holland, 2010).

In response to the 2007-2009 financial crises, HSBC (a renowned British bank) opted to implement a knowledge management system by reconstituting policies and developing knowledge based solution for employees working in all echelons. Holland (2010) advocated that the survival of HSBC may be credited to their more heedful approaches to the development of such a framework. However, Swedbank (a renowned Scandinavian bank) implemented a refined economic model based on human capital (or an intangible asset) that provides a knowledge-based solution especially in times of the economic downturn (Holland, 2010).

Organisational learning and organisational growth are directly proportional. According to Holland (2010), the most common reason behind the banking failure during the crises was core learning errors and lack of concentration on the development of intellectual capital (e.g. intangible resource). It not only spoiled the organisational learning, but also decelerated the risk management process. Therefore, continuous learning from experience more than, or at least half of the rate of change in the environment could be an adjunct to sustainable competitive advantage (Revans, 2011). In spite of the less concentration on environmental threats and bank learning, some failing banks, e.g. the Bank of America, utilised sophisticated learning and knowledge management capabilities. However, they experienced

unintended problems of misplaced focus of knowledge and poor top management's willingness regarding learning, knowledge creation, knowledge sharing and knowledge use. Unquestionably, a dynamic learning system plays a decisive role in knowledge creation capabilities (or intellectual capital) of banking organisations. According to Holland (2010), this knowledge can only be revived through new 'experiences and cognitive skills of bankers' and information of all internal and external stakeholders' such as, workers, clients and suppliers etc.

The implementation of the knowledge management system in the banking industry is still a dilemma. Even though, this system can improve the process and resource management, the complexity of the banking environment and dealing with the intense amount of information at one point of time makes this process unworkable in the banking operation (Ali and Ahmad, 2006). However, in spite of the complexity in the implementation of this system (especially in banking organisations), most of the banks in Western Europe now adopt the knowledge management system in order to attain a sustainable competitive advantage (Blesio and Molignani, 2000). In case of banks, the massive inflow and outflow of knowledge at any point of time will not only be difficult to manage but sometimes it may lead to the diminishing of associated benefits of this information. Knowledge management as a process sets a new dimension for banks as 'it drives innovation by capitalising on organisational intellect and experience' (Duffy, 2001, p.3). Therefore, it is intended to encourage and sustain the new knowledge creation and sharing mechanism as an indispensable element in banking success (Ali and Ahmad, 2006). Therefore, underlying research is an endeavour to encompass knowledge as an important factor of production that capitalises on the developmental benefits of resources and to promote not only the knowledge culture in financial business and operations, but to encourage knowledge sharing and creation and to build readiness to implement that knowledge-based organisational system throughout the banking operations (Al-Ali, 2003; Arner and Schou-Zibell, 2011). Henceforth, an empirical study has been designed to contextualise the knowledge creation phenomenon in a diverse cultural context and to understand the organisational dynamics in the changed scenario of the knowledge economy. In this regard, various empirical studies have validated this correlation and

other attempts are still in the process of understanding this phenomenon. However, it can be prolific if the practice of a different methodology and strenuous analysis kept up, with close consideration to the specific definitions of the numerous concepts and empirical models involved.

As far as developing countries are concerned, the banking industry in Pakistan is relatively more knowledge-intensive sector than other sectors as it contains heterogeneous and pervasive knowledge capital (Akhtar, 2001). The post-globalisation knowledge influx not only changed work-related values at both individual and organisational levels, but it also unbalanced the level of competition between a dominant player of the banking industry (Balino and Ubide, 2000; Akhtar, 2001). After the privatisation of Pakistan banking corporations, the banking industry turned into a global industry but was still poised for competitiveness and growth (Jamal and Naser, 2003). In the midst of this growing concern, the Pakistani banking system is principally procedural driven. In this situation, the manual processing of spacious volumes of data and the paucity of its integration normally produces 'knowledge silos' that make a knowledge management laborious (Cole-Gomolski, 1997). However, the privatisation of state-owned banks helped to improve the information technology (IT) platform and human resources to some extent. Despite this, the sensitivity of the banking operations intimidates Pakistani banking organisations to capitalise knowledge as a factor of production that is inimitable, formalised, and exploitable by all members. Therefore, this empirical study is to unfold whether or not knowledge creation is a factor in developing countries and to what extent leadership is willing to create a knowledge culture in the Pakistani banks.

1.5 Research Aim and Objectives

1.5.1 Aim

The fundamental aim of underlying empirical study is to investigate the relationship between organisational culture and knowledge creation process. Stated in a different way, this study aimed to imply the cultural influences on knowledge creation process in knowledge-intensive banks in Pakistan. However, the following objectives are specified that will help the researcher to achieve the fundamental aim of this research.

1.5.2 Objectives

- **i.** To construct a methodology for investigating the relationship between independent and dependent variables.
- **ii.** To establish and validate a research instrument, depending on the appropriate models for measuring an organisational culture and knowledge creation process within Pakistani commercial banks.
- **iii.** To examine, critically evaluate, and synthesise the empirical relationships between organisational culture and knowledge creation using structural equation modelling.
- **iv.** To investigate the core issues related to the policy framework of Pakistani commercial banks, from the knowledge management strategy perspective.
- **v.** To triangulate research findings and evaluate the relevance of `western' literature on the established frameworks of organisational culture and knowledge creation process.
- **vi.** To suggest practical implications for the managers in Pakistani commercial banks to develop and improve their knowledge creation process in the banks.

1.6 Key Definitions

Table 1.2: Key Definitions		
Term	**Author**	**Definition**
Knowledge	Davenport and Prusak (2000)	A fluid mix of framed experience, contextual information, values and expert insight that provides a framework for evaluating and incorporating new experiences and information.
Knowledge Management	Davenport and Prusak (2000)	The knowledge management process includes knowledge generation, codification and coordination, and transfer which imply knowledge absorption and use.
Knowledge Creation	Nonaka et al., (2006)	The process of making available and amplifying knowledge created by individuals, as well as crystallising and connecting it with an organisation's knowledge system.
Knowledge Strategy	Kasten (2006)	Knowledge strategy is defined as the set of guidelines and beliefs that shape an organisation's manipulation of knowledge.
Knowledge Employee	Drucker (1998)	Knowledge employee is one who works primarily with information or one who develops and uses knowledge in the workplace.
Knowledge Intensive Organisation	Gold et al., *(*2001)	The firm that comprising of technology, structure, and culture integrated with 'knowledge process architecture' of acquisition, creation, transformation and dissemination of necessary organisational capabilities for effective knowledge management.
Explicit Knowledge	Nonaka (1994)	Knowledge that is easily codified and normally shared asynchronously and also can be stored in the rules, guidelines and routines.
Implicit Knowledge	Nonaka (1994)	Personal and organisational knowledge that can be transformed, by using, knowledge management techniques, into formats that can be shared with and transferred to others.
Tacit Knowledge	Nonaka (1994)	A personal knowledge embedded in individual experience and involves intangible factors, such as personal beliefs, perspective, and the value system. Tacit knowledge is hard to articulate with formal language.
Organisational Culture	Denison et al., (2006)	The underlying values, beliefs and principles that serve as a foundation for an organisation's management system.
Knowledge Culture	Travica (2013)	Knowledge culture is a form of organisational culture that combines elements of individualistic, group and macro-organisational cultures to facilitate a heedful management of the entire knowledge management process.

1.7 Thesis Structure and Outline

This thesis contains five chapters, each of which iteratively develops the themes and issues of organisational culture and knowledge creation within the context of Pakistani Commercial Banks. A brief synopsis and indicative content of each chapter is summarised as follows.

Chapter one summarises the motivation of this study and discusses the organisational needs for knowledge creation in general. It also describes and explains the significance of this study for banks within the context of changing patterns of the global knowledge economy and the prevailing threat of the financial crisis.

Chapter two explains the theoretical and empirical literature in the field of organisational culture and knowledge creation is categorically reviewed. In general, this chapter focuses on the theoretical and empirical aspects of organisational culture and knowledge creation process. On the theoretical side, this chapter examines the numerous key definitions and concepts of organisational culture and knowledge creation process. However, on the empirical side, related epistemological models of knowledge creation have been very briefly reviewed.

Chapter three briefly outlines the theoretical framework and hypotheses of this study based on organisational culture values (i.e. empowerment, team orientation, capability development, core values, coordination & integration, organisational learning, organisational change, strategic direction & intent, goals & objectives, and vision) and knowledge creation process (i.e., socialisation, externalisation, combination, and internalisation).

Chapter four summarises the methodological framework and process of research design utilised to accomplish the aims and objectives of the research. It describes and explains the research design and research procedure that will be employed to investigate the area of knowledge creation and the impact of organisational culture on it. It starts from the philosophical stance of research with the choice of the survey method in relation to methods and approaches. Second, the rationale and employability of research methods and research approach are illustrated. Also, the sampling design and procedure in the mixed-methods research is presented along with data collection techniques which is summarised in the last.

Chapter five contains three parts. First part comprised on the analysis of demographic data followed by scale validation of knowledge creation and

organisational culture scales to assess the structural validity, reliability and unidimensionality of the scale and to test the validity of selected variables through the adequacy of the hypothesised factor structure. However, third part contains hypothesis testing results and analysis using structural equation modelling (SEM).

Chapter six outlines the procedure of qualitative data collection and data analysis approach with an objective to investigate the core issues related to the policy framework of Pakistani Commercial Banks, from an organisational culture and the knowledge creation strategy perspective. Moreover, the objective of this chapter is to explain the way through which participants were accessed, interviews were conducted, and qualitative information obtained. Also, it explained the qualitative data analysis using software known as Nvivo.

Chapter seven summarises the findings of this theoretically developed and empirically investigated study that was intended to examine the relationship between organisational culture and the knowledge creation process in the knowledge-intensive Pakistani banks. The discussion chapter begins with the aim and mixed-methods research questions that were deliberately included for sake of recalling the memories. It summarises the empirical findings based on the knowledge creation process in Pakistani banks. However, the last part summarises the empirical relationship between the four organisational culture values and the knowledge creation process.

Chapter eight encapsulates a summary of the key study findings followed by the key research contributions. The practical implications of the study and the limitations of the research are also included after summarising the challenges of the study encountered during the whole research journey. Finally, the area of future research is summarised in the closing section.

CHAPTER 2

LITERATURE REVIEW

2.1 Culture - Historical and Contemporary Perspective

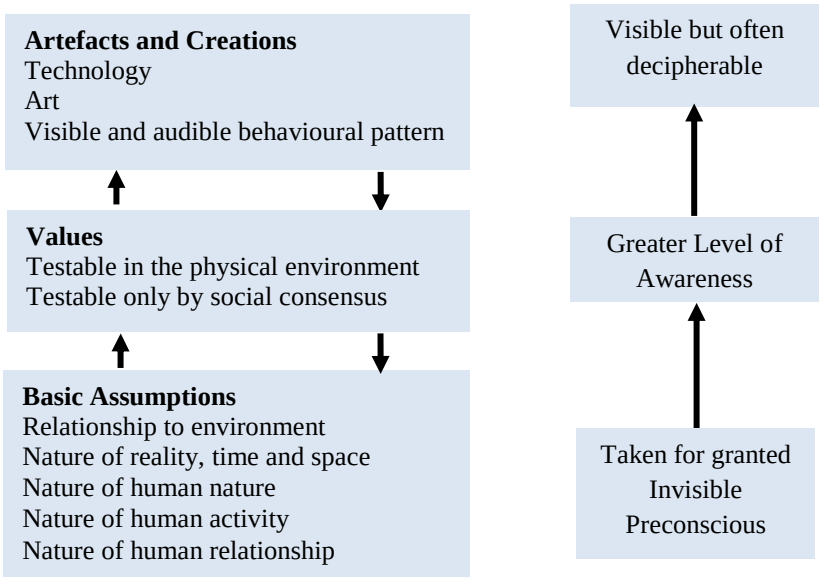
In the last three decades, the concept of organisational culture has gained wide recognition in a way to understand human systems. Prominent books like theory Z (Ouchi, 1981), in search of excellence (Peters and Waterman, 1982), corporate cultures (Deal and Kennedy, 1982), and organisational culture (Frost et al., 1985) highlighted a greater awareness among the managers and policymakers. In response to the changing pattern of global economy, many organisations are getting concerned with the concept of the culture of their organisation to seize the organisational change and development for long-term sustainability. They are not only trying to broaden a profile of their organisational culture, but also find out one which goes with the national cultures of their diverse global operating branches as well.

Schein (1990) identified culture as a pattern of values, assumptions and artefacts which is deeply rooted and embedded. Schein conceives that the values provide a psychosocial and physiological provision for symbolising preferences of an alternative outcome. Assumptions are intangible and taken for granted. Behavioural manifestations are deeply seated, structured and embedded in human nature and present in the sub-consciousness. Whereas, the artefact is a tangible symptom of a culture that only symbolises through customs, myths, stories, slogans and rituals (Sharimllah Devi et al., 2007; Biloslavo and Prevodnik, 2010).

Smircich (1983) classifies four main perspectives (cognitive, symbolic, structural/ psycho-dynamic, and root metaphor) of organisational culture that may have many implications in a micro and macro organisational environment. The cognitivists assume culture as a system of shared knowledge (Smircich, 1983). More intuitively, followers of this perspective reiterate that the organisation runs businesses and treats employees' and managers' relationships on a shared understanding, values, and beliefs that manifest in organisational artefacts such as symbols, language, ceremonies, and narratives (Deal and Kennedy, 1982; Trice and Beyer, 1993).

However, symbolic anthropologists gave special importance to the shared symbols and meanings and narrate individual actions with experience and understanding (Smircich, 1983). The structural and psycho-dynamic perspective of culture is formed through a multifaceted and complex process in which the 'manifestation of unconscious psychological processes' configures tacit elements of organisational culture (Smircich, 1983, p.344). However, the cohort of root metaphor assumption sees organisation as a 'subjective social phenomenon' in a more expressive sense that manifests human consciousness and unfolds the patterns that make organised action possible (Smircich, 1983, p.341).

Figure 2.1: Schein's 3 Levels of Culture



In a similar vein, various other theorists described culture from a very different point of view. For example, the social emergent concept of culture has also remained part of management science literature for a long time. In this respect, various authors such as Meek (1988), Hofstede and Hofstede (2005), Markus and Kitayama (1991) and Huang and Wang (2002) found that culture emerges from social interaction through the emotional association and a sense of belonging between groups and members. Haag et al. (2010) further conceived that the process of socialisation not only strengthens cultural values, but it may be used to create new ideas, knowledge and concepts. In this connection, the tendency to regard culture as a socially administered mechanism implies different implications. For example, in terms of knowledge, culture conveys the contextual impact on people's behavior, ideas, rules, strategies,

technology, administration and control. As a result, socially sprouting culture may also create or recreate over time because it cannot pretend that when, how, and for how long it may be created, altered or destroyed (Huang and Wang, 2002). Hence, business success is now being appraised with cultural manifestations despite the fact that cultures and societies are confronted with many peremptory challenges due to globalisation.

The concept of culture is also being discussed from the cognitive perspective of the culture which emphasises the cognitive dimension of culture that is based on empirical or factual knowledge (Martin, 2002). Another form of culture definition is entirely acquisitive. For example, Mills (1988, p.352) defined "culture is a process of conceptional development positioned within the context of definite material conditions." Schein's multi-stage culture model is also pertinent to understand organisational dynamics (Schein, 1990; Haugh and McKee, 2000). It is argued that the three stages move top to down and bottom to up presenting diverse theoretical and methodological implications. As shown in Figure 2.1, the artefacts are visible but indecipherable factors that an organisation makes public by exemplifying them through vision statements, company slogans, physical ambiance, daily operation and product and service process; they provide a clue about organisational culture. Espoused values at the second level usually reflect how members act together and respond to environmental or external forces. Correspondingly, values are dominant over management decisions and enhance employees' dependability, cohesiveness and credence. It implies that the basic assumptions are usually deep-rooted which may influence human activities, behaviour or relationships and provide the basis for the values. Thus, basic workplace assumptions are more accountable to fabricate strong organisational culture because it may indeed have impacted significantly on the outcomes of the other levels. Admittedly, if strong culture is to be sustained then it could be helpful to manage decisions and confer very deep beliefs, values, and assumptions which are connected to the organisational history and collective wisdom or knowledge.

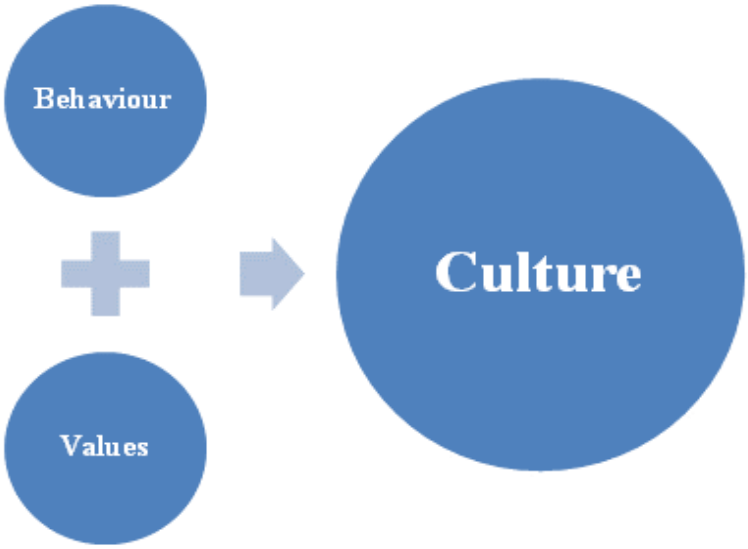
Specifically, organisational shared behavioural expectations (e.g. system norms) and normative beliefs (e.g. system values) are responsible for creating an inter-organisational bootstrapping which is a self-sustaining process that may be preceded without external help (James et al., 2008). In other words, workplace normative beliefs (or system values) and shared behavioural expectations (or system norms) depict the way individuals perceive the personal impact of their work environment on themselves (Glisson and James, 2002; James et al., 2008). Therefore, it can be argued that organisational culture is shaped by varying facets of organisational life whereas different organisational contexts in terms of vision, mission, strategies or interpersonal relationships may shape or reshape people's inherited beliefs and assumptions that may have a greater impact on workplace performance, output and competitiveness (Cabrera and Bonache, 1999). In contrast, theorists also believe that the organisational culture is already specified which is relatively manageable under the influence of management activities (Smircich, 1983; Denison et al., 2004; Beugelsdijk et al., 2006). Because organisational culture has a tendency to influence inter-organisational relations thus a shared value mechanism constantly regulates a behavioural manifestation of members (Christensen and Gordon, 1999).

2.1.1 Culture and Values

The organisational values are supposed as the most appropriate sign of organisational culture from the point of view of its potential role in knowledge creation capability (Biloslavo and Prevodnik, 2010). For example, Hofstede and Hofstede (2005) conceive that people do not inherit culture, but it exists at different levels, layers or within mental programming. Cameron and Quinn (2011) indicated its presence (or occurrence) in the prevailing leadership approach, the symbols and language, the routines and dealings, and the success stories that make an organisation distinctive. Nevertheless, Biloslavo (2006) characterised it as a set of artefacts of employee behaviour, including values and basic underlying assumptions which coordinate this behavior. Therefore, behaviour (or identity) is established, maintained and changed through cultural context (or situation) that can be manipulated, interpreted, altered, assessed, accepted or rejected (Hatch and Schultz, 1997). The aforesaid definitions also connote two significant concepts: i) organisational culture is a set of explicit and

implicit rules; and ii) it is influenced by (or constituted within) core values, norms and underlying assumptions (Biloslavo and Prevodnik, 2010).

Figure 2.2: Culture, Values and Behaviour – Kotter (2008)



Likewise, the concept of organisational values has been widely used in researching and comparing behaviour across cultures because of the fact that 'values are easily accessible than assumptions and more reliable than artefacts' (Howard, 1998; Haag et al., 2010). For some researchers, the concept of value is an inherent characteristic that is individually or socially preferable. For that reason, values can be apprehended at an individual and group/social/cultural level (Rokeach, 1973). Haag et al. (2010) indicated the significance of both the culture and values rather than merely focusing on one concept only. The author cited from Kluckhohn and Strodtbeck's (1961) description of value orientation that the value orientation is a complex but categorically patterned (e.g. rank-ordered) principles, resulting from the transaction interplay of three rationally distinguishable elements of the evaluation processes: i) cognitive; ii) affective; and iii) directive elements, which provide an order and direction to the ever flowing stream of human acts and thoughts that may be related to the solution of the general human problems (Kluckhohn and Strodtbeck, 1961, p.341). In addition, Kotter (2008) structured two levels of culture. According to author, values contain invisible status quo; therefore, an organisational member remained ignorant from its occurrence since these organisational values are hard to

change. Hence, organisational members normally resist any change process and prefer to maintain the current status quo.

The concept of culture is also evaluated through its correlation with values and behaviours. In this regard, Lamond (2003) conceptualises that the organisational values vary from culture to culture and organisation to organisation. Therefore, values can only be appraised through the lens of an individual or collective mindset. In general, the behaviours are relatively visible because a behavioural manifestation of employees that exist in the organisation can be changed, managed or altered. Lave and Wenger (1991) also highlighted the role of culture on behaviour and argued that the behaviour can only be contextualised in daily routines, practices and activities. For that reason, it could be prolific if individual behavioural patterns, manifestations and routine tasks and activities are examined through the lens of culture (Biloslavo and Prevodnik, 2010).

In line of stated argument, scholars agreed on the fact that organisational culture will adjust and maintain a particular identity and transform an individual's behaviour. Therefore, cultural attributes may well be used to manipulate explicit behaviour or it is going to be inferred, appraised or accepted, altered and discarded otherwise (Hatch and Schultz, 1997; Biloslavo and Prevodnik, 2010). Therefore, culture can be used for intellectual development (De Witte and Muijen, 1999). An intellectual act at a higher mental capacity and culture has a tendency to broaden this mental capacity up to a certain level by escalating thinking that eventually stimulates external adaptation and internal integration to solve problems (Hatch and Schultz, 1997 and Schein, 2009).

2.1.2 Dynamics of Organisational Culture

Organisations are highly dependent on culture and the cultural values for existence and survival (Fatehi, 1996). Although, most of the organisations rely more on the internal and external environment; corporate culture is identical in almost all instances (Kanungo, 2006). Since, culture is the outcome of human actions and its resulting performance. Therefore, cultural understanding facilitates to complete a set

task successfully whereas corporate culture has multiple aspects. The institutional culture first presets different perceptions and then interprets it within the paradigms of organisational values and the human mindset. However, due to the unrelated value system, people in different cultures react in an unlikely fashion. In effect, organisational culture shapes management practices differently for every organisation. Hence, in a changing global business scenario, cultural implications are the dominant aspect to understand management policies and practices (Trompennars, 1993 and Gray et al., 2003). Organisational culture has been meditated as a prominent concept and as a composite descriptor that could impart substantial influence on management decisions in different domains of leadership, knowledge management and conflict resolution (Howard-Grenville, 2006). In a similar vein, organisations contain multiple cultural types. Therefore, management science researchers established models to determine the characteristics of organisational culture based on dominant cultural values that may be utilised to respond to the challenges and changes in the environment (Gray et al., 2003).

Literature is also prudent about the individualistic perspective of culture. It is acknowledged that culture may have such a tendency to influence human enactments that create a synergy effect and hold an organisation together (Smircich, 1983). According to Caligiuri et al., (2010), culture is strongly embedded with an employee's sense of belonging that derives from stabilising and enhancing the social system. The correlation between organisational culture and the individuals' perceptions, attitudes, and behaviours cannot be underestimated. Although, it depends on how members perceive and respond to situations within the predisposed frame of reference. Culture assists to deal with vagueness or organisational bewilderedness by elucidating what is important and how beliefs, values, and norms could be utilised to resolve the ongoing organisational conundrum (Howard-Grenville, 2006).

On the other side, perception has been created that people's values, norms and attitudes either cannot be altered or transformed. For this reason, culture of organisational life cannot be analysed in terms of a universal unitary concept (Meek,

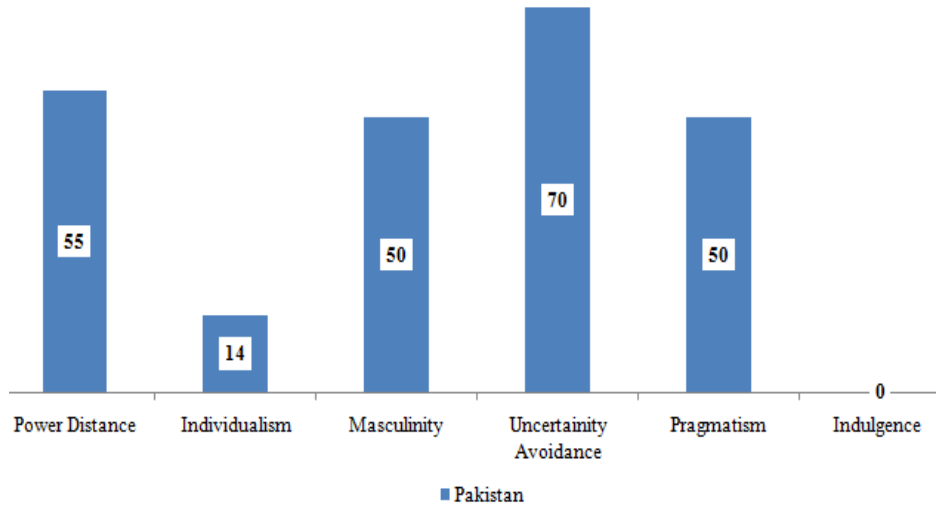
1988). In response to this, researchers also asserted that the organisational ineffectiveness can be supplanted by applying changes in people's values, norms and attitudes. Schein (1984) also provided that a strong culture is connected with effectiveness and can be intentionally created. Therefore, researchers established that organisational culture can be an influential diagnostic tool to comprehend organisational dynamics in changed and blurred circumstances (Kilmann, 2003 and Howard-Grenville, 2006).

In addition, many authors used the term culture as a 'knowledge' because culture has different characteristics, and it can be characterised as a complex set of knowledge, belief, custom, morality, law or symbol attained by an individual or society (Tylor, 1958; De Witte and Muijen, 1999). The relevant literature treats organisational culture as a 'root metaphor' in which people developed their behaviours, emotions and beliefs or it can be utilised to manipulate their behaviours, emotions and values. It can be articulated through Schienstock's (2000, p.13) definition that "culture is a network of interlocking rituals, norms, assumptions, and values that have developed out of continuous interactions among the members of an organisation." The aforesaid definition exemplifies the notion that organisational norms and values are the outcome of workplace socialisation and continuous interaction between members that can ascertain individual behaviours and emotions.

Another important antecedent of organisational culture is its association with different organisational outcomes. For example, the correlation between leadership, job satisfaction, and employee performance and organisational culture is well developed (Schein, 2006). Nonetheless, the literature is hitherto prudent in clarifying the impact of organisational culture in knowledge creation, sharing and use within organisations (Gray et al., 2003). Therefore, lack of empirical frameworks that relate knowledge creation and various dimensions of organisational culture establishes our conceptualisation that knowledge creation capability thrives by unlike cultural attributes because continuous interactions (socialisation) can multiply the process of attaining a new knowledge (Nonaka, 1995).

Moreover, cultural values are deeply rooted in people's beliefs. This belief derives from continuous interactions among members and socialisation activities. It is, however, substantiated that organisational culture can substitute people's belief that may be the basis for knowledge creation and sharing in an organisation. However, neither Schienstock (2000) nor any other researcher has described how interlocking values, beliefs norms or assumptions are associated with continuous interactions between the members. What are those antecedents? How can they be significantly correlated with each other? And up to what extent knowledge creation accounts for a wide range of antecedents of inter-connectivity among members to different antecedents of interlocking organisational culture parameters.

Figure 2.3: Pakistani Culture Score



Adopted from: http://geert-hofstede.com/pakistan.html

2.1.3 Pakistani Culture from the Lens of Hofstede's Culture Dimensions

In order to assess the influence of culture on the cognitive process of knowledge conversion between tacit and explicit knowledge, the difference in the learning styles between countries and cultures need to understand. For example, Nonaka and Takeuchi (1996) suggested that the Japanese prefer tacit knowledge, while people in the Western world (i.e. America & Europe) use explicit knowledge in daily routine. Also, in a low context organisational culture e.g. America & Europe, employees and managers use images, analogies, charts and presentations for their learning. In contrast, people in the high context organisational culture, usually work without additional formalised and explicit explanations (Andreeva and Ikhilchik, 2011).

As a matter of fact, the scope of this research is limited to investigate the empirical relationship between organisational culture and knowledge creation only. Stated in a different way, this study aimed to imply the cultural influences on knowledge creation, but does not truly explore how the Pakistani or South-Asian approach in terms of knowledge creation may be different. Therefore, in order to develop a comparative approach and discuss why knowledge creation is different in Pakistani or South-Asian versus America and Europe, cross comparative study can be carried out.

However, in order to assess whether or not Pakistani banks can best utilise its knowledge (i.e. explicit and tacit) resources and does senior management create the right context for knowledge sharing (Von Krogh et al., 2000a) and pay emphasis on the tacit knowledge creation through four processes of the SECI model, [1]Hofstede's national culture dimensions can be used to assess the cultural differences and/or similarities in Pakistani organisations which are further used to identify the organisational learning style, workplace socialisation, and knowledge sharing and transfer in Pakistani banks. As shown, Pakistan scores 55 on the [2]power distance index, while at [3]individualism/collectivism index, Pakistan scores 14. However, high score of Pakistan at [4]masculinity/femininity index indicates that the characteristics of masculine and feminine dominated society which indicate society stands on merit,

[1] http://geert-hofstede.com/national-culture.html

[2] In a power distance society, "less powerful members of organisations or institution within a country expect and accept that power is distributed unequally". In other words, countries, which are high, on power distance index represent disparities, unfairness and disproportion amongst societies (or cultures) and its impact on the individuals, family members and society as a whole (Hofstede, 2001). However, almost identical score of Pakistan and Japan on this index indicates that both counties are hierarchical societies. Since, in hierarchical organisational structure members accept inequalities because of centralised decision making and autocratic management approach which is usually dominant in all layers of organisational pyramid.

[3] In individualistic societies, members retain their interdependence by putting harmony of group above the expression of individual opinions. However, in a collectivist society, people are integrated into strong, cohesive groups. Therefore, society propels through strong interaction where every person takes accountability for other members of their group. Also, due to frequent socialisation between members' culture of trust and loyalty grow and protract. However, in an organisational context, the acquaintance between management and employees' based on moral provisos.

[4] Societies, which are low, on this index indicate the feminine dominated society. In such societies, quality of life is the symbol of success. It means that people always yearning to accomplish what they want.

competition, achievement, and determination. In other words, Pakistani is a country with high power distance, high uncertainty avoidance, and low individualism. Due to features of collectivist society, employees are often encouraged to share ideas but have no authority to implement. As a result, decision making resides within the hands of senior hierarchy (Khilji, 2003). In spite of corporate sector restructuring in response to globalisation, power distance mindset is dominant factor in the Pakistani organisations.

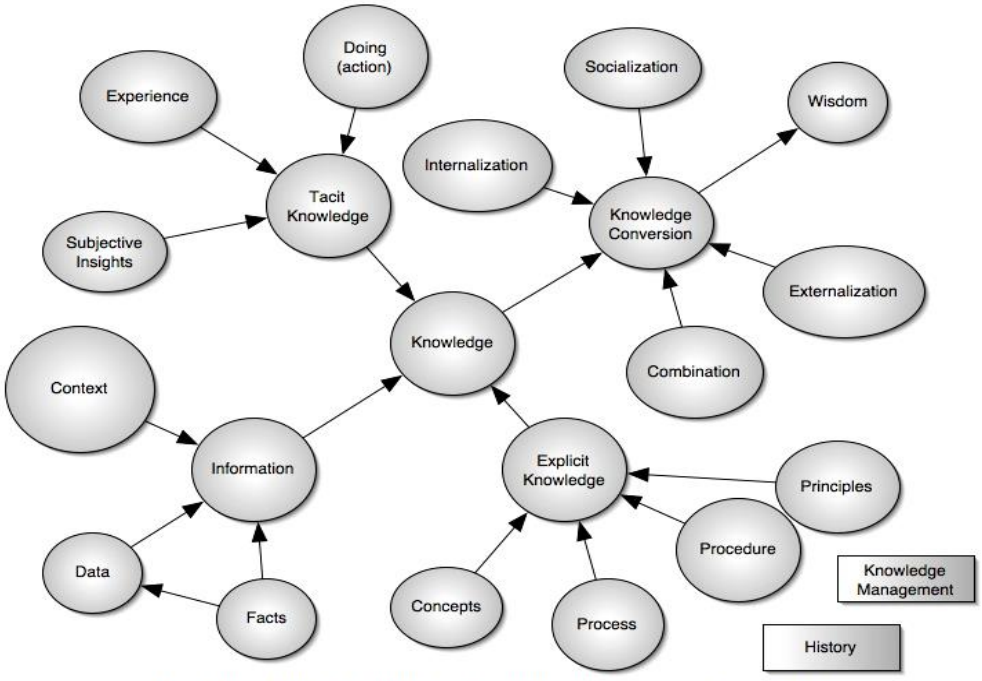
2.2 Knowledge

The major shift from tangible factors of production (i.e. land, labour and capital) in the industrial economy to an intangible factor of production (i.e. knowledge) in the knowledge economy has also shifted the management science researcher's interest in the field of knowledge management (Castells, 2010 and Boateng, 2011). The deployment of knowledge considered as a prime mover of the global economy and organisation's competitive advantage (Gunnlaugsdottir, 2003). The KM scholastics reported several definitions and taxonomies of knowledge (Zander and Kogut, 1995; Dixon, 2000; Gunnlaugsdottir, 2003). Until the mid-1980s, management scholars considered 'knowledge' to be interchangeable with 'information' (Nonaka et al., 2006). The penetration of information processing into mainstream organisational theories not only increased indulgence of existing information at the expense of organisational knowledge creation but it also hoisted efficacy of many of the mainstream theoretical assumptions about cognition and knowledge (Nonaka, 1988a). In effect, at the end of 1980s, the concept of knowledge as a 'justified true belief' was evolved, and both explicit and tacit aspects of knowledge were discussed in the knowledge management literature (Nonaka, 1994). Meaningless to say, knowledge has been taken credence in the early 1990s after the appearance of Nonaka's SECI knowledge creation theory.

In context of knowledge, facts without context are known as 'data' (Gunnlaugsdottir, 2003). The information is obtained through sorting and analysing raw data that was communicated through several verbal and non-verbal ways (Dixon, 2000). In contrast, knowledge is a meaningful link between information particularly when information is put in a logical and understandable context which we can verify and

recall from our experience (Dixon, 2000; Gunnlaugsdottir, 2003). Newell et al. (2009, p.23) stated "semantic aspects of information create knowledge". However, knowledge tends to remain information until it remains within people's minds (Davenport and Marchand, 1999). But when people enable to infer meaning from information on the basis of their cognitive capacity and interpretive schema, it could lead to the creation of a new and different knowledge (Nonaka, 1995; Newell et al., 2009).

Figure 2.4: Knowledge Typology Map

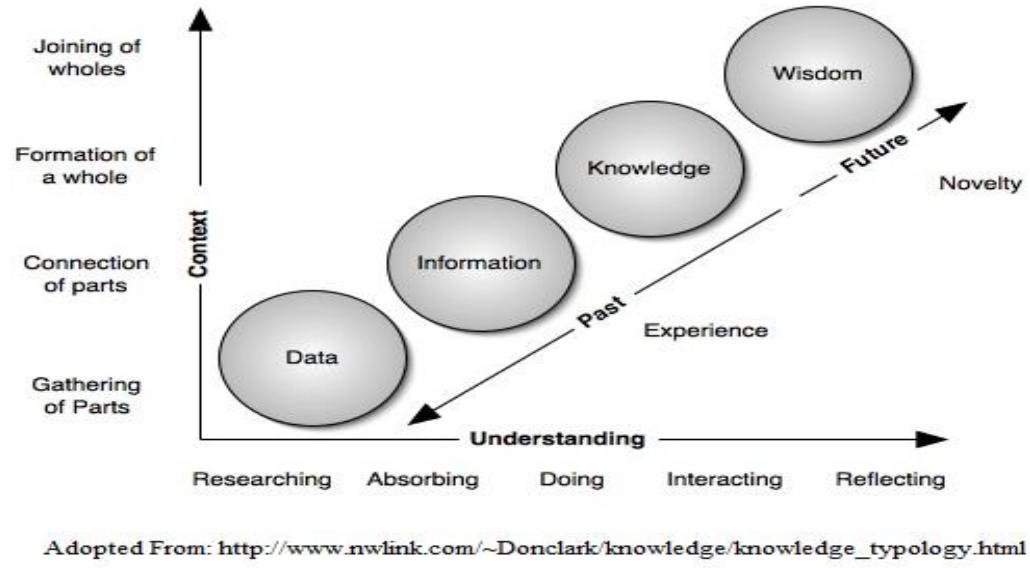


Adopted From: http://www.nwlink.com/~donclark/knowledge/knowledge_typology.html

As in the knowledge typology map, knowledge can be divided into two types typically known as explicit and tacit (Polanyi, 1967; Nonaka, 1995). Explicit knowledge is more expressive, objective and rational that can easily be distributed or transmitted (Suppiah and Sandhu, 2011). Arguably, explicit knowledge can easily be codified and written down to be transmitted manually by means of words or numbers, mathematical terminologies, testimonials or specifications; likewise**,** it can be processed electronically through computer databases (Polanyi, 1967; Nonaka and Takeuchi, 1996; Suppiah and Sandhu, 2011). Tacit knowledge is personal knowledge. It is ingrained in intangible aspects such as personal behaviours, beliefs, values, stories, symbols and rituals. It implies that the tacit knowledge is contained in

people's minds and due to the epistemology of possession; it is difficult to access and cannot be detached (Cook and Brown, 1999; Newell et al., 2009).

Figure 2.5: Continuum of Knowledge



Adopted From: http://www.nwlink.com/~Donclark/knowledge/knowledge_typology.html

In addition, Jasimuddin et al., (2005, p.106) noted "tacit knowledge is less vulnerable but less accessible by legitimate organisational users; whilst explicit knowledge is more accessible but also more vulnerable to illegitimate exploitation." Bhardwaj and Monin (2006) and Wang (2006) describe tacit knowledge as a source of inspiration that could only be contextualised through systematic and intuitive cognition process. More specifically, researchers have mentioned two aspects of tacit knowledge: one is technical whereas another is cognitive. The technical aspect may be more subjective with procedural 'know-how' that could be developed from years of experience and derived from personal insights, perceptions, hunches or stimulations. Correspondingly, the cognitive aspect consists of beliefs, perceptions, ideas, values, emotions and mental models so ingrained in us that we take them for granted. This aspect demonstrates one's perceived choice and the tendency to see the world from one's own way and means.

Paradoxically, knowledge (or epistemology in philosophy) has no single approved definition. Preliminary work on this ground has been done by the famous philosopher Plato by arguing that knowledge is a 'justified true belief'. For instance,

it assumes that, for a given true proposition; one must not only believe the relevant, true proposition, but one must also have justification for doing so. In other words, for a given proposition X, if Y believes that X is true, then Y is justified in supposing that X is true. Nonaka and Takeuchi (1996) upholds the above stated Plato's premise and argued that individuals justify the reliability of their observation based on their observations of the world; therefore, justifying turning around on the personal susceptibility, capability, and knowledge.

Table 2.1: Definitions of Knowledge

Author	Year	Definition
Davenport and Prusak	1998	Knowledge is a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knower. In organisations, it often becomes embedded not only in documents or repositories but also in organisational routines, processes, practices, and norms
Nickols	2000	Knowledge is a state of knowing, the capacity for action which is codified, captured and accumulated facts, principles, procedure and/or techniques.
Stanley Cavell	2002	Knowledge is related to the capacity of acknowledgment in human beings
Karl Sweiby	2001	Knowledge is a capacity to act
Andre Boudreau	1978	Things that are held to be true in a given context and that drive us to action if there were no impediments
Nonaka and Takeuchi	1994	Justified true belief that increases an entity's capacity for effective action
John Locke	1986	The perception of the agreement or disagreement of two ideas

In the literature, the word knowledge also viewed as an acquaintance with someone or something which can include information, facts, descriptions, or skills acquired through experience or education since knowledge has the capacity to act on information (Fitchett, 1998); 'bodily acquired skills' (Nonaka et al., 1998); and something that is believed, that is true, and that is reliable (Denning, 1999). Another school of thought affirms knowledge as an important tool for defining a certain situation because of its compatibility with other elements in the system. This compatibility may be supportive in defining a situation rather than to finding a solution of basic problems (Von Krogh et al., 2000a).

The complex nature of knowledge has increased the propensity on the part of organisations in solving problems on the way to compete. It is, therefore, argued that

due to non-conforming characteristics and types (e.g. tacit and explicit) of knowledge, it is not possible to assimilate or absorb knowledge systematically. Likewise, individual assumptions and context specific information also play their role in defining what knowledge exactly is and how it is being systematised (Demarest, 1997). Arguably, some of the scholars, for example, Lank, (1997) considered organisational knowledge as invisible while Quintas et al., (1997) considered it as an object. Knowledge can also be classified on the basis of ascertain task dependent and domain specific facets. For example, de Jong and Ferguson-Hessler (1996) depicted four types of task dependent categories of knowledge explicitly known as situational, conceptual, procedural and strategic knowledge. In contrast, Alexander and Judy (1988) described three domain specific categories of knowledge usually known as declarative, procedural, and conditional. Knowledge can also be the discernment of compliance or non-compliance between two ideas.

As, Davenport and Prusak (2000, p.41) defined that "knowledge is a fluid mix of framed experience, contextual information, values and expert insight that provides a framework for evaluating and incorporating new experiences and information". Compliance or non-compliance between two ideas is an identical phenomenon which may be treated as knowledge. For example, while looking at a glass of water, one can argue that the glass is half filled with water, whereas others perceive that the glass is half empty. It implies that our act of perceiving objects is the result of our past (framed) experiences, beliefs, values and assumptions. This shows how we tend to feel, evaluate and incorporate new experiences and the information is purely based on our preconceived frame of reference (Davenport and Prusak, 2000). In other words, Drucker (2009, p.32) wrote that "knowledge is information that changes something or somebody either by becoming grounds for actions, or by making an individual (or an institution) capable of different or more effective action".

However, in order to understand how knowledge is transformed progressively between two axis and two points, it may be significant to understand the continuum of knowledge. As shown in Figure 2.5, the level of understanding is directly proportional to the context specific information. On the x-axis and y-axis continuum,

the level of understanding increases as far as the contextual information increases. In other words, context specific information tends to clarify data, information, knowledge and wisdom correspondingly. For that reason, one can say that knowledge may be context specific (Elsbach et al., 2005) and subjective in nature (Nonaka et al., 2001). Thus, it can be created, shared and stored through social interactions (Von Krogh et al., 2000a and Tsoukas, 2009). In addition, primordial nature of tacit knowledge can be created through an interactive process (as described in the first SECI knowledge conversion mode) in which cultural traits (or contexts) encourage and influence organisation members to adopt and create new knowledge (Bhardwaj and Monin, 2006).

The knowledge in the organisation is classified at the individual and collective level. For instance, individual knowledge held by an individual can be used for undertaking a new organisational task in a different way. However, when individual knowledge is shared with other employees, it becomes collective knowledge as it is held by a group of members (Chua, 2002). Knowledge always requires some ‘solid origin and context’ although from the organisational standpoint it is a key challenge that knowledge is context specific (Elsbach et al., 2005). Meanwhile, knowledge pro-activeness and its strategic use are vital for any organisation especially at the time of an economic downward spiral. In this respect, knowledge in all forms (such as tacit, implicit and explicit) becomes the lifeblood of an organisation.

2.2.1 A Critique of Justified True Belief (JTB) Theory

The exposition of knowledge as ‘justified true belief’ also confronted criticism from fellow researchers. In spite of very sound justifications in support of a long-established point of view that knowledge is justified true believe, Gettier (1963) indicated flaws in the definition by arguing that justified true belief does not adequate for knowledge. Although, this is beyond the scope of this study to discuss Gettier criticism and his philosophical question i.e. "Is Justified True Belief Knowledge?" Instead, it would be pertinent to clarify what researchers mean by justification.

According to the Gettier (1963) how any true proposition (or piece of information) counts as knowledge on the basis of someone else's invalid justification and/or faulty premise. Gettier proposed two cases based on three conditions (i.e. justification, truth, and belief) seemingly required, but argued that the individuals justify the reliability of their observation not on the basis of their observations of the world but on the basis of certain factor of luck (e.g. good or bad) involved. For example, in support of his claim, Gettier theorise that the 'bad luck' by and large impede the 'justified belief' from being true as compared to 'good luck' that swaps the bad luck so that 'justified belief' ends of true.

In other words, both true and justified beliefs must contain the element of luck that permits the process of justifying knowledge rather to prevent the process in order to clarify knowledge. In support of his claim, Gettier presented two cases (i.e. Case I and Case II) based on the two counterexamples and emphasise to satisfy all the conditions deemed mandatory in the JTB analysis. Both cases argued that the justification needs something that follows rationale or logic and it applies extensively and/or can be applied reasonably with a specific condition (or proviso) that supports one's apparent belief. For sake of clarification, Gettier's cases are illustrated as follows:

Case I:

> ...John has applied for a job, but, it is claimed, has a justified belief that "Robert will get the job". He also has a justified belief that "Robert has 10 coins in his pocket". John therefore (justifiably) concludes (by the rule of the transitivity of identity) that "the man who will get the job has 10 coins in his pocket".

Case II:

> ...John, it is claimed by the hidden interlocutor, has a justified belief that "Robert owns a Ford". John therefore (justifiably) concludes (by the rule of disjunction introduction) that "Robert owns a Ford, or James is in

Edinburgh", even though John has no knowledge whatsoever about the location of James.

The statement in the case-I implies by the fact that, John gets the job instead of Robert. Though, as it happens, John also had 10 coins in his pocket either naively or by chance). So his belief that "the man who will get the job has 10 coins in his pocket" was justified and true. But it does not appear to be knowledge. However, case-II indicates that Robert does not have a Ford, but due to just coincidence, James actually is in Edinburgh. Again, John had a belief that was true and justified, but not knowledge.

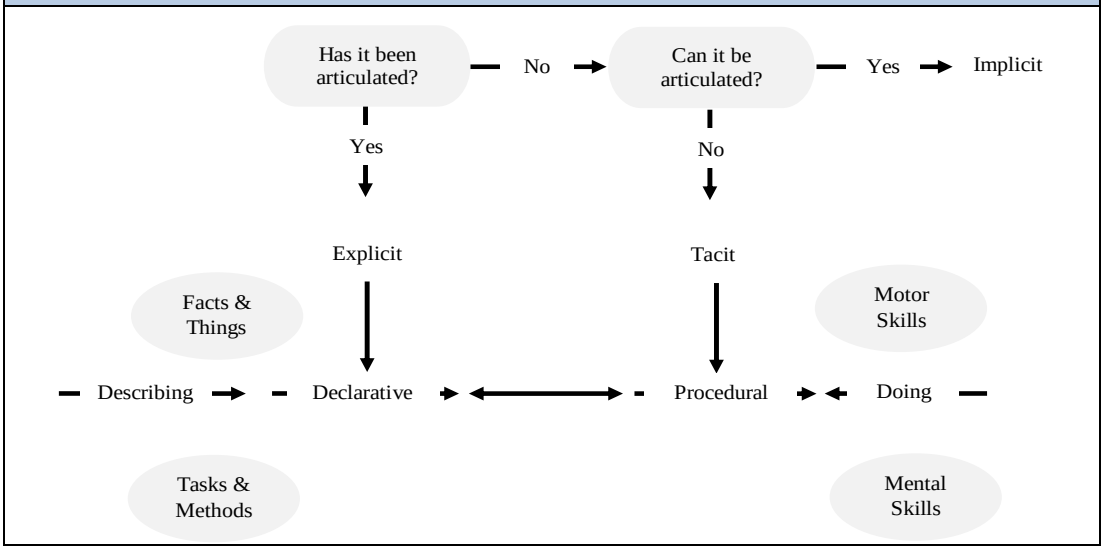
Although that the propositional discourse of JTB has been criticised for its insufficiency and inability to provide justification for knowledge, the theory still considered as a requirement for knowledge unless an alternative definition of knowledge may not be proposed. For example, Dancy (1985, p.26) quoted that "it must be possible for a false belief to be justified and a justified belief must justify any belief which it implies." In spite of the Gettier problem, JTB yet to be essentially sound and knowledge is equal to JTB i.e. K = JTB (Sellars, 1975). In line of aforesaid argument, it can, however, conceive that the 'justified true belief' provide a solid foundation for knowledge.

2.3 Nichol's Work on Implicit Knowledge

In spite of creation and sharing of knowledge, the work of Fred Nickols mainly spotlights the mechanism of managing knowledge. In order to understand the mechanism of managing knowledge, the clear distinction between explicit-tacit and declarative-procedural knowledge can be helpful. Nikolas clearly explained the meaning of the key terms, knowledge as well as supporting terms, especially, implicit and strategic knowledge. More specifically, Nickols (2000, p.12) wrote that "the clear understanding of the different basic terms in knowledge management and the difference between the knowledge and what we mean by knowledge in knowledge management is complementary if claims are being made that knowledge can be managed."

Nickols (2000, p.13) defined knowledge as a state of knowing, the capacity for action which is codified, captured and accumulated facts, principles, procedure and techniques." For instance, the state of knowing is ability of knowing and/or ability to be familiar with facts, principles, procedure and techniques. The capacity of action increases know-how in order to seize the facts, principles, procedure and techniques that can be captured and articulated tangibly in the form of documents, books, papers, manuals, codes and formals. In addition, knowledge is a state of mind as well as internal capacity for action that can be articulated and frequently captured in the form of explicit, implicit and tacit knowledge (Nickols, 2000).

Figure 2.6: Explicit, Tacit and Implicit Knowledge – Nickols (2000)



As shown in Figure 2.6, the explicit knowledge is knowledge that can be articulated and, more frequently, captured in the form of documents, books, papers, manuals, diagrams, codes, formulas, etc. In contrast, the tacit knowledge cannot be articulated. Nickols cited from Polanyi (1997) that the human capacity to recognise knowledge as a whole or some of its parts often fails to capture its essence during decomposition of the constituent elements. According to the Nickols (2000), the subsistence of an implicit knowledge is inferred and conditional. Therefore, the implicit knowledge can be articulated but depends upon the observable behaviour and performance. Nickols (2000, p.15) wrote that "implicit knowledge that can often be teased out of a competent performer by a task analyst, knowledge engineer or other person skilled in identifying the kind of knowledge that can be articulated but hasn't." However, the aforesaid three categories (i.e. explicit, implicit, and tacit) of knowledge can further

be divided into two categories: declarative and procedural by cognitive psychologists. The third category i.e. strategic knowledge also part of the literature.

2.3.1 Declarative Knowledge

The distinction between declarative and procedural knowledge is posited by John Anderson in 1976. The declarative knowledge is same as explicit knowledge in terms of description of facts, procedures, methods, and techniques. However, due to similarities between declarative and explicit knowledge when articulated, both knowledge categories normally treated one and the same. Therefore, the practical implication of the declarative knowledge is same as explicit knowledge.

2.3.2 Procedural Knowledge

The related literature posits different views when describing procedural knowledge. One school of thought holds that procedural knowledge is a result of doing something. The followers of this opinion argue that the both non-psychological (mental) i.e. mechanical or manual skills and psychological i.e. cognitive or mental skills typically manoeuvre the process of knowing and doing something. In contrast, another school of thought posits that procedural knowledge is basically about how to do something. Therefore, this view of procedural knowledge involves particular description of a task likely to be performed. Nickols (2000, p.16) acknowledged that the description of knowledge as declarative and rest as procedural for a particular task or application to a situation in which the knowing may be said to be in the doing, however, implies that the declarative knowledge said to be explicit just as procedural knowledge is tacit.

2.3.3 Strategic Knowledge

The strategic knowledge basically deals with know-when and know-why categories of knowledge. Nickols (2000, p.17) argued that strategic knowledge should not be taken as a separate category of knowledge. Therefore, strategic knowledge can be considered as a compartment of declarative knowledge instead of its own category.

2.4 Knowledge Management Systems and Processes

There is a consensus among knowledge management scholars that knowledge is a company's only enduring source of advantage in an increasingly competitive world (Birkinshaw, 2001). Knowledge management becomes a prerequisite for public and private organisations for gaining a competitive advantage (Rai, 2011). To gain a competitive advantage, the banking organisations adopt knowledge management (Mizintseva and Gerbina, 2009). In recent years, banking and financial sector organisations are treated as fundamental drivers of innovation and change. Therefore, organisations need to adopt a knowledge management system so as to attain competitiveness among the fast-paced companies of the twenty-first century (Quinn, 1992; Christopian, 2008).

In a knowledge-based-view of the firm, knowledge strategy is taken for granted as the employment of knowledge processes in existing and new knowledge domains (Nonaka and Takeuchi, 1996; Hansen et al., 2000; Nonaka et al., 2006). However, due to the lack of research in banking organisations from the perspective of a knowledge-based view of the firm (e.g. intellectual and human capital), it can be argued that the banking organisations overlooked knowledge as a key element in 'competitive differentiation' (Gratton and Ghoshal, 2003).

The value of the service sector organisations is made of intangible assets such as intellectual capital and human capital. The only product sold in the professional (or specialised) service sector organisations such as banks, accountancies or consultancies are intellectual capital (Chatzkel, 2002). The intellectual capital is considered as the most important asset in the service sector organisations because it represents new ideas and a source of competitive advantage (Davenport and Prusak, 2000 and Wiig, 1997). Some of the firms' leverage in intellectual assets will affect the firm's stock prices as it deals more diligently with intellectual capital in order to attain 'growth of specialisation' and corporate survival in the knowledge-based economy (Christensen and Anthony, 2004). Yang and Lin (2009) also emphasised knowledge and creativity as a means for adding value to financial sector companies,

highlighting the crucial need for the measurement and management of intellectual capital.

More specifically, the benefits associated with intellectual capital in terms of knowledge, knowledge creation and knowledge utilisation are currently being widely acknowledged. According to Davenport and Volpel (2001. p.58), "despite the fact that knowledge is often gathered on the topic of best business practices and processes, most organisations have not taken a conscious process-oriented approach to knowledge management and knowledge work." The intellectual capital that exists in 'stocks' of the knowledge at individual and collective level can be tacit or explicit (Bontis et al., 2002). Curado (2008, p.142) wrote that "stocks are the amounts of the components at a certain point in time, and flows are the permanent conversions of intellectual capital that take place between any of its form." Therefore, management should keep focus on the development of human capital, organisational processes, and organisational knowledge so that employees become knowledge workers and organisations remain competitive (Joshi et al., 2013).

In addition, intellectual capital has focused on knowledge management and taken knowledge resources (explicit + tacit), human resources (skills + abilities) and information technology (system + processes) concurrently. Therefore, followers of this approach keep emphasising on the management of all these elements conjointly for producing wealth from intellectual capital (Ponis et al., 2010). Knowledge utilisation as an input in the shape of an individual and collective know-how, experience, idea, and opinion provides an added advantage in an exceptionally flexible way to meet varied supply-demand gaps of the customers in the sector. The codified knowledge (e.g. formal education + professional training and development) and tacit knowledge (e.g. working experience + client and manager interaction) plays an important role in knowledge utilisation as an input (Forstenlechner and Lettice, 2007).

However, the knowledge creation is a dynamic process that might not be accomplished until some societal and organisational conditions are not satisfied

(Andreeva and Ikhilchik, 2011). For instance, knowledge management cannot be undertaken in a vacuum (Nisbett et al., 2001) as it requires effective knowledge management strategy, a clear methodology and processes (Ellis, 2005). In this regard, prior work has given undue importance to knowledge management frameworks; very few researchers have discussed the underlying factors that are likely to facilitate the knowledge creation process in the organisation (Arling and Chun, 2011). In terms of societal and organisational conditions, the knowledge management researchers have discussed the effects of managerial support on the successful knowledge management application. For example, the top management's willingness and knowledge vision is likely to support knowledge management strategy in the organisation (Mizintseva and Gerbina, 2009). Hoffman et al., (2005) found top managers while Lee and Choi (2003) and Nonaka and Takeuchi (1996) found middle managers to support the successful knowledge management implementation. The timely funding for knowledge application (Wong and Aspinwall, 2006) and knowledge-oriented culture (Davenport and Prusak, 2000) played a vital role in the efficacy of knowledge-based decisions.

Although, there are equal growth opportunities to employees during the knowledge management process implementation, it also provides a sense of ownership between employees and enhances the level of trust that positively impacts on knowledge creation, sharing and use (Brockman and Morgan, 2003). The ability of knowledge employees in capturing and utilising knowledge to make strategic decisions is also crucial for routine banking functions. For example, dealing with customers in the routine banking operations requires an organisational structure that supports knowledge management activities in the banks. In the same way, banks are also required to provide the necessary training to their staff in order to handle complex banking jobs (Ping and Kebao, 2010). In order to get the most value from their intellectual assets, banks are required to implement a thorough knowledge management system for managing knowledge in banking operations. In response to the changing environment, senior management showed willingness on knowledge sharing and transfer and increased their access to knowledge databases in order to improve the quality of the operations through the process improvement in changing

the spectrum of the economy, industry and sector (Kridan and Goulding, 2006; Alrawi and Elkhatib, 2009). The process of managing knowledge in the banking can be attained with the process improvement and amplification of (tacit + explicit) knowledge creation system.

Table 2.2: Knowledge Management Systems and Processes - Becerra-Fernandez et al., (2004)

KM Process	Knowledge Discovery		Knowledge Capture		Knowledge Sharing	Knowledge Application	
	Combination	Socialisa-tion	Internalisa-tion	Externalisa-tion	Exchange	Direct ion	Rout ines
KM System	Knowledge Discovery Systems		Knowledge Capture System		Knowledge Sharing System	Knowledge Application System	
	KM Mechanism				KM Technologies		
	On-the-job trainings, Metaphors and Analogies, Employee Rotation, Learning by doing, Mentoring and Coaching, Meetings, Goal orientation, Conferences, Brainstorming, Workshops, Monitoring and evaluation				Decision support system, Web-based discussion groups, Repositories of best practice, Artificial intelligence system, Web pages		
KM Infra-structure	Culture	Structure	I.T Infrastructure		Common Knowledge	Physical Environment	

In addition, learning and innovation in the knowledge-intensive organisations are a social phenomenon that requires an informational environment for knowledge to be shared, transferred and contrasted (Nonaka, 1994) through an effective communication across individual and organisational boundaries that facilitates the capture and share of the codified knowledge (Slepian, 2013). Hence, it is argued here that the knowledge management infrastructure in the knowledge-intensive organisations in general and banks in particular must be capable of substantiating the informational needs of the knowledge management process; in other words, a typical banking knowledge management system composed of competitive knowledge management technologies. The continuous interface between human and technology permits banks to manage its intangible assets and ensures the perfection of planning which will increase the efficacy of bank operations and support risk management issues (Mizintseva and Gerbina, 2009).

According to the findings of empirical research conducted in the banking industry, it was revealed that the performance of knowledge creation is directly proportional to the human capital, and ‘cognitivists’ and ‘connectivists’ are the foremost knowledge creation enablers (Shih et al., 2010). In response to the global recession and financial

sector internationalisation and liberalisation, the banking industry was constrained to transform its internal and external business mechanisms by providing knowledge-based services other than conventional borrowing and lending business (Shih et al., 2010). Therefore, in a changing environment, knowledge appeared to be an indispensable factor and there is an ever increasing need to understand intellectual capital and the knowledge creation correlation especially in a complex and changing scenario of banking operations (Lin et al., 2008 and Shih et al., 2010).

However, the typical banking knowledge management initiatives must be taken as an "integral part of the overall corporate strategy that aims to grow, explore and exploit the company's knowledge to increase shareholder value" (Dzinkowski, 2001, p.3). This follows arguments from Nematizade and Branch (2012) that 'knowledge-oriented structure', 'knowledge-oriented technology', 'knowledge-oriented human resource' and 'knowledge-oriented culture' provide a special knowledge management capacity. Thus, top management support (supporting and sharing culture), technology (digitisation of documents and speedy search of information for its re-use) and organisational learning (training courses, employee incentive programs, mentoring, and communities of practice) are significant enablers for knowledge management (Yeh et al., 2006). This links strongly to the view that organisational learning is a product of three factors: organisational culture, structure and substructure. It further implies that organisational culture with a supporting corporate strategy promotes an environment of trust and confidence in which individuals and organisations feel free to create, share and disseminate knowledge (Delong and Fahey, 2000; Biloslavo and Prevodnik, 2010).

Apart from the knowledge management infrastructure, Ahmed et al. (2002) posit the significance of employee-employer trust, strong relationship, and intrinsic motivation for creating a knowledge sharing culture in the organisation. Knowledge sharing culture in the organisation encourages people to come closer and express their feelings, grievances, and other work-related issues. For this, few other factors such as organisational culture, technology, employee training, and teamwork usually promote knowledge sharing in the organisation (Mizintseva and Gerbina, 2009). In

this regard, Becerra-Fernandez et al.'s (2004) knowledge management framework also contemplates the basic underlying aspects of knowledge management from the perspective of organisational culture, structure, information technology system, knowledge deposit, and physical environment.

2.4.1 Organisational Culture

The significance of organisational culture in success of knowledge management initiatives is widely acknowledged in the literature. For instance, culture facilitates employees to understand the associated benefits of knowledge management thus encourage knowledge sharing (Ellis, 2005). The organisational culture attributes such as, senior management support for KM, employee awareness to the value of KM practices, encouragement of interaction for the creation and sharing of knowledge, and incentives for the achievement of knowledge goals are few enablers for creating a knowledge culture in the organisation (Becerra-Fernandez et al., 2004). However, potential organisational impediments may limit employee interaction and restrain the knowledge creation and sharing process. It is, therefore, argued that "organisational culture that hinders knowledge creation through workplace politics, harsh criticism of new ideas, destructive internal competition, avoidance of risk and an over-emphasis on the status quo" (Amabile et al., 1996, p.115). In other words, destructive internal competition may be one of the impediments that destroy employee morale to create, share and exchange ideas. It also raises doubts on the management policies and keeps employee put off from knowledge creation and sharing activities. This organisational impediment dispirits all types of socialisation norms and practices through which employees can exchange their ideas, knowledge, information and feelings. In addition, top management criticism may be the reasons that restricts employee empowerment and restrain them from taking informed decisions thus increase their reluctance on sharing ideas or important workplace information.

2.4.2 Organisational Structure

Despite that the organisational structure is closely related to the culture of an organisation, a knowledge organisation has a democratic culture Alipour et al. (2011) and a decentralised flatter structure Becerra-Fernandez et al. (2004) that permits

capture and share learning so that the organisation may continue to progress and develop competitively (Calantone et al., 2002). Anantatmula and Stankosky (2008, p.27) pointed out "an organisational structure should be able to handle tacit knowledge, and change it into explicit knowledge." It is argued here that the changing business realm of the knowledge economy has created a striking difference between the culture and structure of the organisations especially when organisation intended to implement knowledge management systems. For this, some organisations extended positions in their conventional hierarchy and introduced new positions, such as, chief knowledge officer (CKO), knowledge analyst, knowledge manager and knowledge engineer to handle knowledge management issues. These reforms in the basic organisational structure together with knowledge management system development support the process of managing tacit and explicit knowledge (Anantatmula and Stankosky, 2008).

2.4.3 I.T Infrastructure

The advent of the knowledge economy has doubled the knowledge need of workers to accomplish their work. As a result, digitisation and I.T infrastructure development to meet the knowledge needs through capturing and sharing explicit knowledge of an organisation by providing shared common access to information (Becerra-Fernandez et al., 2004). In other words, knowledge accessibility and flow in the organisation is also one of the important requirements of knowledge creation. It requires that the members of all cadres and ranks must have a free access to corporate information (or databases) via information technology. However, technology is merely an enabler or tool because the knowledge creating company usually constrained to utilise technology in routine operations for gaining sleek access to the information (Anantatmula and Stankosky, 2008 and Nickols, 2000). In other words, human-technology interface facilitates individual knowledge creation (cognitive system) and organisational knowledge creation (social system) mechanism through an integrative mechanism of both processes (Kimmerle et al., 2010). This also supports the basic system theory paradigm that reiterates the use of social interaction and digital technologies by which individual learning knowledge creation can be undertaken. It is argued here that the social interaction may be the main source in deploying tacit

knowledge in the workplace using advanced knowledge management systems, information technology, knowledge base and other expert systems for the continuous process of sharing and observing life or work experiences through social interaction and replicating these interactions with learning by doing may be the source of creating new knowledge (Anantatmula and Stankosky, 2008). Likewise, an accurate, accessible, and useful knowledge flow requires sophisticated information system that must be responsive and approachable for every employee working in the organisation. After digitisation of banking operations and multifaceted information system implementation, most of the banks allow employees, customers, and other stakeholders collect routine information. It is argued that the knowledge and information resources in the present banking operations permit systematised and customised solution to all knowledge related issues and problems.

2.4.4 Common Knowledge

In an organisational context, the common knowledge facilitates communication and coordination, enhances unity to the organisation, provides recognition of individual knowledge domains and supports knowledge transfer within the organisation while impeding knowledge transfer outside the organisation (Zander and Kogut, 1995; Argote and Ingram 2000 and Becerra-Fernandez et al., 2004). In addition, common knowledge integrates with the other knowledge in the organisation through which it increases the value of that that particular organisation (Becerra-Fernandez et al., 2004).

2.4.5 Physical Environment

The physical environment of an organisation also acknowledged as a facilitator for knowledge capture and sharing. Becerra-Fernandez et al., (2004) pointed out that the physical ambiance of the building including location, size, number, type, and nature of the rooms plays an effective role in the knowledge capture and sharing. For instance, the most of the staff obtains most of work related knowledge during informal conversation in lunch breaks, cafeterias and office corridors than office manuals and formal face-to-face discussions. Therefore, senior management should

leave provision for such places e.g. open-offices and chambers in which an informal dialogue between staff can be prevailed (Stewart, 2000; Becerra-Fernandez et al., 2004).

In conclusion, focusing more narrowly on the research done on the knowledge management within organisations in general and within banks in particular found that the knowledge management practices within organisations can be categorised as exploitation and exploration (Zack, 2002; Ichijo, 2006). The knowledge exploitation deals with the transfer and diffusion of the existing knowledge. In contrast, the process of knowledge exploration, however, supports the creation of new knowledge (Curado, 2008). In context of banks, the knowledge management system is the 'source of connecting people, processes, and technology' (Alrawi and Elkhatib, 2009). The banking industry only be dependent on the knowledge management system that often useful for the creation of a centralised communication system based on knowledge management systems and technologies (Mizintseva and Gerbina, 2009; Kridan and Goulding, 2006).

In terms of knowledge management within banks, the subsequent section of the literature review focuses on two distinct themes. The first theme focuses mainly on the organisational culture that considers as a primary success factor in knowledge creation, sharing and use. The second theme highlighted the way through which an individual, a group, an organisation, an industry, create, share and disseminate knowledge (Nonaka, 1994; Nematizade and Branch, 2012). Henceforth, this study draws on the literature on knowledge creation process (exploration) to link supporting corporate knowledge creation strategy (societal and organisational conditions + management knowledge vision) and organisational culture that knowledge-intensive banks intend to pursue.

2.5 Knowledge Management Implementation and Use in Banks

The typical knowledge management system and process in the banks are different from other organisations as spacious data flows through many channels that make it more complex to implement (Bowen and Ford, 2002). Therefore, the banking

knowledge management system provides supportive organisational conditions for the collection, sorting and transformation of knowledge which are to be subsequently replicated or formed (Mizintseva and Gerbina, 2009). In other words, knowledge creation and sharing in banks may be growing with a number of supported programmes and management tools such as consultative decision making (Nonaka and Takeuchi, 1996), mentoring (Bryant, 2005), concept mapping and knowledge packets and free access to corporate information (Mizintseva and Gerbina, 2009). For this, organisational learning can be discussed as a source of the knowledge creation process under a supportive organisational (system and technology) and societal (knowledge sharing culture) conditions for knowledge management initiatives in the banking firms.

In response to the change in the global business environment, most of the banks implemented knowledge management so that knowledge can be managed in routine banking operations (Dzinkowski, 2001 and Li, 2013). However, the banking knowledge management system in different developing countries consisted of knowledge sharing and knowledge creation. The digitisation of banking operations and implementation of an IT platform shifted conventional banking into modern banking based on more updated information and knowledge provider to their customers (Li, 2013). The banking knowledge management initiatives also used to support organisational cultural factors, such as employee empowerment, teamwork, cohesiveness, knowledge sharing and communication (Chatzoglou and Vraimaki, 2009 and Li, 2013).

If we looked back in history, the World Bank was the first who implemented KM in 1996; up to the first quarter of the 2000, it was implemented in countries of Europe (United Kingdom, Germany, Portugal, Spain), and the West (United States of America (USA), Canada) and Japan. However, some of the banks in developing countries (e.g. Malaysia, United Arab Emirates, Libya, Tunisia, Mauritius, and Lebanon) adopted KM systems in the third and fourth quarter of the last decade. In terms of scholarly research, very limited research was carried out on KM in banks within developing countries. According to the published research in this area, a

general perspective of knowledge management is more focused on knowledge creation, sharing and retention, quality of service, innovation, competitive advantage, and customer loyalty. For instance, the Central Bank of Malaysia implemented a banking knowledge management model (BKMM) based on knowledge creation, retention and sharing which enhances the quality of banking operations (Ali and Ahmad, 2006). The KM system in the Iranian banks is more customer-focused which is normally used for managing customer knowledge (Azhdar et al., 2010). In the Lebanese bank, informal mentoring significantly had an impact on knowledge sharing and exchange during a performance job in the bank (Halawi and McCarthy, 2008). However, the KM system of Central Bank of Bahrain used to increase the information accessibility and flow by using the appropriate technology and improving human skills (Mohammed and Jalal, 2011). The Islamic Development Bank of Saudi Arabia recognised the power of information by replacing conventional means of banking with more innovative capabilities, organisation information processes for managing knowledge and competitive business advantage (Amir and Rugayah, 2011).

In the case of South Asian countries, (e.g. Pakistan, India, Bangladesh), the researcher found only one related study carried out in the ICICI Bank of India which highlighted the initiatives of KM in the bank with the help of senior management support but without any financial funding (Goswami, 2008). Therefore, this particular study, however, is designed to investigate the senior management's KM vision and support of organisational culture in the knowledge creation process in Pakistani banks by applying Nonaka's SECI model of organisational knowledge creation.

The banking sector in Pakistan is relatively a more knowledge-intensive sector than other sectors as it contains heterogeneous and pervasive knowledge capital. A post-globalisation knowledge influx not only changed work-related values at both individual and organisational levels (Akhtar, 2001), but it also disproportionated the level of competition between dominant players of the banking industry (Balino and Ubide, 2000; Akhtar, 2001). After the privatisation of Pakistan banking corporations,

the banking industry turned into a global industry but still poised for competitiveness and growth (Jamal and Naser, 2003). In spite of the growing concern, the Pakistani banking system is principally procedure driven (Akhtar, 2001). In this environment, the manual processing of spacious volumes of data and lack of integrations create 'knowledge silos' that make knowledge management laborious (Cole-Gomolski, 1997). However, privatisation of state-owned banks helped to improve the knowledge accessibility through an IT platform to some extent. The sensitivity of the banking operations intimidates banking organisations to capitalise on knowledge as a factor of production that is inimitable, formalised, and exploitable by all members. The following section summarises the theoretical perspective of the SECI knowledge creation process in more detail.

2.6 Theoretical Perspective of Knowledge Creation

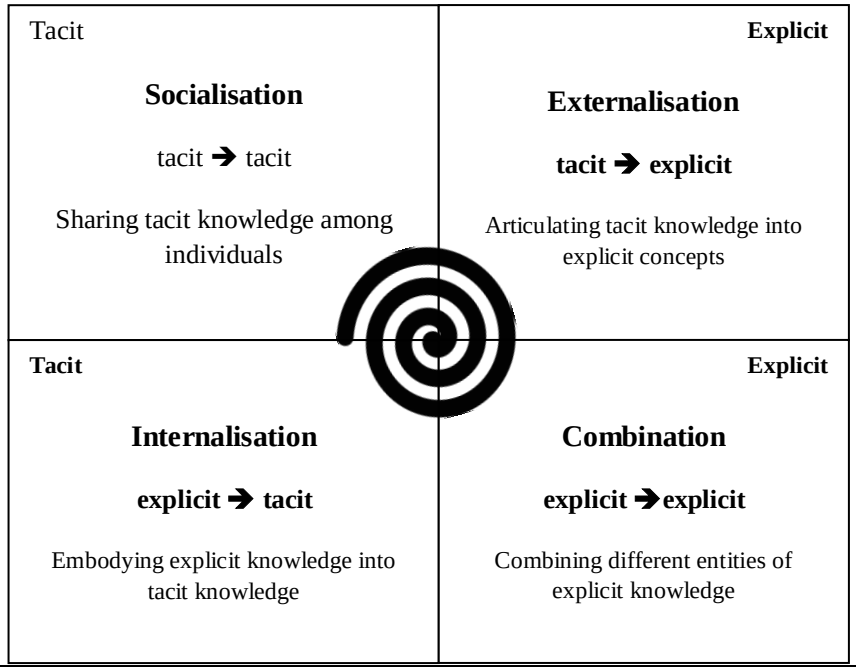
The knowledge creation phenomenon first appeared in knowledge management literature when Nonaka (1994, p.5) noted "successful companies are those that constantly create new knowledge, distribute it extensively throughout the organisation embody it in new technologies and products." It hypothesised that the knowledge is created through the recurring (or cyclical) interaction between tacit and explicit knowledge. For instance, Nonaka et al. wrote that:

> …knowledge creation is a continuous process through which one overcomes the individual limitations and restrictions imposed by prevailing information and experience by attaining a new perspective, a new observation of the environment and new knowledge. (Nonaka et al., 2000, p.7)

In knowledge creation process, the spiral of knowledge (see Figure 2.7) is created when both tacit and explicit knowledge is complementing and interfacing each other through four switching modes; namely: socialisation, externalisation, combination and internalisation. Hence, it is the process in which personal knowledge is continuously validated by integrating someone else knowledge through the four modes of knowledge conversion spiral (Nonaka et al., 2006, p.5). Constant and dynamic interaction between tacit and explicit knowledge always takes place at the

individual, group and organisational level, shaping a knowledge spiral that fosters the knowledge creation process (Nonaka and Takeuchi, 1996; Von Krogh et al., 2000a). Conceptually, Nonaka's work is based on the Polanyi's two types of knowledge; namely tacit and explicit. The tacit knowledge is personal knowledge while explicit knowledge is formal or documented knowledge. The tacit knowledge is difficult to communicate or exchange than explicit knowledge. Nonaka and Takeuchi (1996) utilised two knowledge types for making new knowledge through the knowledge conversion spiral which is indispensable for innovation, competitiveness, growth and long-term sustainability in a knowledge economy. However, in order to understand the mechanism of the SECI knowledge conversion modes, its brief overview is important. Therefore, the researcher intends to define each of the four modes:

Figure 2.7: SECI Knowledge Conversion Model - Nonaka and Takeuchi (1996)



2.6.1 Socialisation

The first knowledge conversion mode (i.e. tacit ➔ tacit) is the "process of sharing experiences through social interaction (or socialisation) and thus creating tacit knowledge such as shared mental models and technical skills" (Nonaka and Takeuchi, 1996, p.62). In the first phase of the knowledge conversion process, existing tacit knowledge is transformed to create a new type of tacit knowledge (Nonaka and Takeuchi 1996; Nonaka et al., 2000 and Byosiere and Luethge, 2004).

According to Polanyi (1967), tacit knowledge is a personal or intangible knowledge which is hard to articulate with formal language.

Table 2.3: SECI Knowledge Creation Modes		
Tacit Knowledge	Socialisation	Externalisation
The personal knowledge that cannot be communicated in a formal and systematic language (Wilson, 2002). Nonaka (1994) defines tacit knowledge as 'highly personal, hard to formalise and, as a consequence, difficult to communicate, transfer or share.'	It is a process of 'sharing experiences and thereby creating tacit knowledge such as shared mental models and technical skills.' (Nonaka and Takeuchi, 1996, p.62).	The process of concept creation and is triggered by dialogue or collective reflection (Nonaka and Takeuchi, 1996, p.64).
Explicit Knowledge	Combination	Internalisation
The knowledge that can be communicated in a formal and systematic language (Wilson, 2002). According to Nonaka (1994), 'explicit knowledge is knowledge that can be expressed, codified, stored in databases or as text in books or articles, transferred, shared and managed by knowledge management tools.'	The third knowledge conversion mode involves combining different bodies of explicit knowledge (Nonaka and Takeuchi, 1996, p.67).	Process in which knowledge became valuable when it is internalised in individuals through tacit knowledge bases and shared mental models or technical know-how (Nonaka et al., 2000, p.497). It is closely related to learning by doing (Nonaka and Takeuchi, 1996).

However, the continuous process of sharing and observing life or work experiences through social interaction and replicating these interactions with learning by doing may be the source for creating new knowledge (Nickols, 2000). In an organisational context, socialisation typically occurs during face to face interactions, training programmes or workshops because it makes organisational knowledge more understandable (Davenport and Prusak, 2000; Chou and Tsai, 2004). Therefore, workplace brainstorming sessions, training programmes or homework before prior discussions may enhance the worker's (or learner's) understanding in a given situation to solve a particular problem (Haag et al., 2010). Socialisation can be measured with conversation between people when they show a tendency to share ideas and experiences (Rodrigues et al., 2006). The sharing and exchanging of ideas and experiences take place in formal and informal discussions, face to face

conversations, on-the-job and off-the-job trainings (Rice and Rice, 2005; Salmador and Bueno, 2007; Schulze and Hoegl, 2008; Martin-de-Castro et al., 2008).

2.6.2 Externalisation

The second knowledge conversion mode (i.e. tacit ➔ explicit) typically seen in terms of concept creation and is activated by conversation or collective reflection (Nonaka and Takeuchi, 1996, p.64). In this knowledge conversion mode, tacit (or subjective, intangible, inexpressible) knowledge is converted into explicit (or objective, tangible, expressible) knowledge. The knowledge externalisation can be attained when people get help from technical terminologies and professional language in routine communications with each other in the organisation. More specifically, this conversion mode is activated with conversation or dialogue within teams or groups while performing workplace activities. For example, expressing abstract concepts, explaining and communication with examples, transliteration and un-organised and intangible thoughts into concrete ideas, describing technical or practical terminologies with conversational language, help others to clarify their points or ideas (Nonaka and Takeuchi, 1996; Huang and Wang, 2002).

2.6.3 Combination

The third knowledge conversion mode (i.e. explicit ➔ explicit) is the process in which existing explicit knowledge is collected from knowledge repositories or databases and transformed into more customised, assimilated, remodelled and reconfigured explicit knowledge (Nonaka and Takeuchi, 1996; Nonaka et al., 2000; Byosiere and Luethge, 2004). In the combination phase, people can exchange and combine knowledge in tangible or intangible forms and collect new information by making the connection of new and old knowledge work towards new concepts and organising ambiguous concepts into the structure. Therefore, this SECI mode may well be supported in mutual locations in which the process of assimilating existing explicit knowledge creates new knowledge (Davenport and Prusak, 2000; Nonaka and Konno, 2005). In an organisational context, employees combine the different types of explicit knowledge; for example, organise ideas and make the conclusion facilitate the group discussions; apply experience to help solve problems; taking

notes and making a summary of every meeting; events or discussions; organise others' thoughts, opinions and feelings during group discussion or performing tasks (Huang and Wang, 2002).

2.6.4 Internalisation

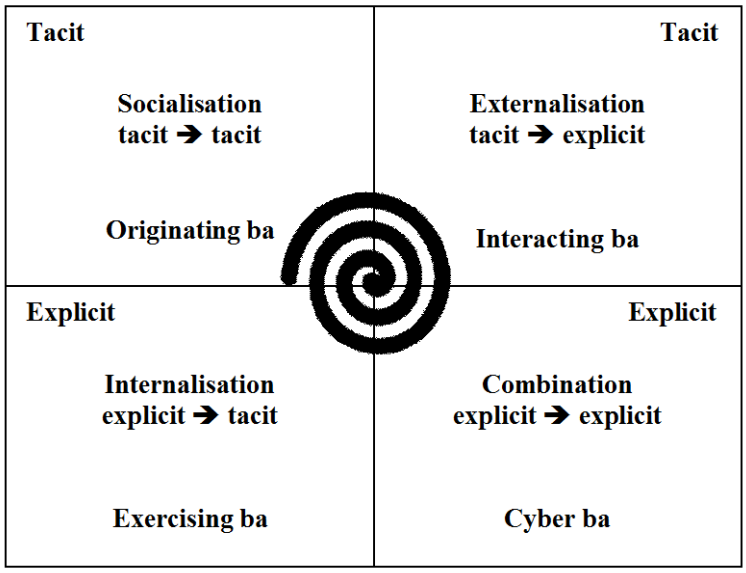
The fourth knowledge conversion mode (i.e. explicit ➔ tacit) is the last sequential stage in which tacit knowledge is created through the process of symbolising explicit knowledge by reviewing and interpreting explicit knowledge and then converting it into tacit knowledge (Nonaka et al., 2000). More specifically, Nonaka et al., (2001, p.63) theorised that "knowledge internalisation is the process in which knowledge becomes valuable when it is internalised in individuals' tacit knowledge base through shared mental models or technical know-how." It is argued here that internalisation involves learning by doing because it strengthens the learner's confidence and knowledge and the skills become entrenched in an individual's mind and can be used in daily routines or a specific context (Haag et al., 2010). In any organisation, internalisation facilitates comparing and contrasting existing and new idea(s) (or concept(s)) with personal experience in order to understand its meaning. It helps personal understanding by rectifying personal mistakes, concepts and understanding making it more eloquent and apprehensible (Huang and Wang, 2002).

2.7 Concept of 'ba' in Knowledge Creation

Nonaka's concept of knowledge creation was re-conceptualised in 1996 through the idea of 'ba'. The organisational 'ba' or 'shared space' (i.e. physical, mental or virtual) provides a basis for knowledge creation. The physical space (e.g. room, office or workplace), mental space (e.g. idea, concept, or experience sharing) and virtual space (e.g. IT platform, Internet or intranet) works as an incubator in which an individual and collective knowledge creation transpires (Nonaka and Konno, 2005). For instance, Nonaka and Konno (2005) noted that originating 'ba' plays its prime and incisive role in knowledge creation by sharing tacit knowledge among individuals through the first SECI mode of socialisation. The doctrine of originating 'ba' derived from 'existentialism' which asserts that shared space provides a basis for knowledge creation through face to face interaction. It is related to human

existence in which individuals are overwhelmingly involved in interaction and their emotions, thoughts and experiences (Nonaka et al., 2001). Therefore, exchange of information, knowledge, ideas, data, collaboration and mobilisation help organisations to countenance requirements and convey shared space. The interacting 'ba' created by the reflection when 'individual skills, knowledge and mental models are changed in general terms and concepts' (Nonaka et al., 2000). It is argued that during externalisation in which tacit knowledge is converted into explicit knowledge, the primary role of interactive 'ba' is to facilitate dialogue within teams and groups in which they engage in a new idea creation and value addition (Nonaka and Konno, 2005).

Figure 2.8: Knowledge Creation 'ba' - Nonaka and Konno (2005)



The cyber (or systematising) 'ba' represents a combination mode in which virtual or non-physical elements (e.g. softwares, databases, repositories and online communication systems) are particularly involved in converting one type of explicit knowledge to another explicit knowledge in order to create a new explicit knowledge (Nonaka et al., 2001). According to Nonaka and Konno, (2005), the SECI combination mode is efficiently operating in information technology supported by the environment because explicit knowledge can only be articulated, codified, stored in databases and transferred, shared and managed by knowledge management tools. However, the exercising 'ba' is purely personal or subjective which relies on one's attitude or belief. Internalisation facilitates continuous learning and self-improvement

through workplace training, mentoring and individual participation (Nonaka et al., 2001). Nonaka and Konno (2005) reported that internalisation can be helpful in converting explicit (e.g. codified) knowledge into tacit (e.g. real life) knowledge and during this process exercising 'ba' play its role of mental modelling and thought refinement.

More specifically, knowledge embedded in the 'ba' which is intangible can be acquired through one's own experience when organisational members share and exchange in this 'shared space'. In a recent qualitative research conducted in twenty-three high tech international firms, Alvarenga Neto (2010, p.209) found that "management of 'ba' and the enabling conditions rather than 'management of knowledge' supports 'innovation, sharing, learning, collaborative problem solving and tolerance to honest mistake". In other words, managing knowledge through 'managing an enabling context' in terms of 'ba' or 'shared space' supports knowledge creation and use (Alvarenga Neto and Choo, 2011). It summarised that:

> ...within KM, what is managed is not knowledge itself, but solely in the context where knowledge emerges and is socially constructed 'ba'…''…knowledge as such cannot be managed; it is just promoted or stimulated through the creation of a favourable organisational context. (Alvarenga Neto and Choo, 2011, p.2)

In spite of the evidence that knowledge creation through managing the context or enabling conditions, the striking challenge within knowledge management is cultural and behavioural (Choo and Alvarenga Neto, 2010). For example, organisational culture provides a specified state that the constructs bond between employees and configures their attitudes and behaviours (Schein, 2006). Lundvall and Johnson (1994) also cited that the culture and behaviour are dominant over the liveliness of the relationships and the likelihood of knowledge creation, sharing and transfer. Nevertheless, in an organisational context in which people work is characterised by numerous artefacts (e.g. leadership, communication, structure, technology, values, norms and stories) counted under the general concept of organisational climate and culture (Schein, 2006). In addition to this, it is argued that the cultural artefacts

facilitate employees to establish relationships through their interaction and communication (Weick, 1995). However, 'ba' can only provide a 'mental or virtual space' rather than a 'cultural artefact of space' that also contains objects and physical environment (Lamproulis, 2007). Therefore, it is argued here that both 'mental or virtual space' and 'cultural artefact of space' provide a basis for knowledge creation within the specified time and space (Nonaka et al., 2000).

2.8 A Critique of Nonaka's SECI Model Theory

In spite of widely acceptance of SECI theory, the knowledge conversion through spiral process remained under some systematic and methodological criticisms from the knowledge management researchers. For example, Gourlay (2006) advocated that the knowledge creation process is same as information sharing process and thus the proposition of new knowledge creation create confusion with knowledge transfer in the matrix.

Stacey (2001) contradicts the tangibility of knowledge by arguing that the knowledge is not a 'thing' because human knowledge is relative that derives from human experience and human reason. In this respect, knowledge neither creates nor manages, because it is self-organising process that configures rationally.

In addition, the applicability of SECI model is also criticised in terms of differences in the learning styles between countries and cultures. For example, Japanese prefer tacit knowledge through socialisation, while people in the Western world (i.e. America and Europe) use explicit knowledge through combination in daily routine. The continuous use of tacit knowledge, however, means that people emphasise on the socialisation process of knowledge creation because they prefer tacit knowledge through direct experience, which is indispensable for the knowledge creation process. In contrast, the continuous use of explicit knowledge in workplace, however, means that people emphasise on the combination process of knowledge creation because it helps them to apply explicit knowledge in a more systematic manner (Haag et al., 2010). According to Glisby and Holden (2003) the difference in the learning styles due to difference in countries culture and thus theoretical and

methodical grounding of SECI model in Japanese organisations made this model irrelevant for the organisations in the western countries.

The conviction of tacit and explicit knowledge as mutually complementary categories is also criticised by other authors. For example, Nonaka and Takeuchi (1995) does not treated tacit and explicit knowledge as opposite, separable and mutually exclusive categories, but treated as mutually complementary categories. In contrast, Johnson et al., (2002) noted that knowledge is neither completely tacit nor completely explicit. Also, Tsoukas (2003) pointed that the tacit knowledge always necessary for proper comprehension of the explicit knowledge.

Tong and Mitra (2009) criticised the practicability of the externalisation process within SECI model while suggesting that knowledge conversion from explicit to tacit is not practically possible because it cannot satisfy the statement made by Polanyi (1966) 'we can know more than we can tell', and Snowden (2003) 'we always tell more than we can write down'. The limitations on the conversion from tacit to explicit knowledge, however, mean that if some tacit knowledge cannot be converted, then it cannot be made explicit. Thus, limitation on the externalisation process undermines the process in which organisations capture tacit (or subjective, intangible, inexpressible) knowledge and converted into explicit (or objective, tangible, expressible) knowledge.

Gourlay (2006) also criticised the validity of the sample used for the survey. Nonaka and Takeuchi recruited senior managers while ignored front line and the other staff. To test the validity of the SECI model, Nonaka and his colleagues only surveyed a sample of senior managers and ignored the other staff. However, in the knowledge creation process, the 'carrier of knowledge' is an individual (i.e. employee) at the all hierarchical levels e.g. top, middle and front line. Therefore, an additional work recommended by other researchers recruiting employees from all hierarchical levels in the organisation for a better understanding.

2.9 Justification for Use of the SECI Model

Despite of the criticism on the SECI model, it has strong theoretical basis to be used in national, organisational, professional, and personal cultural levels. It has potential to cover both knowledge creation and transfer at individual, group, and organisational levels. The culture and its impact on knowledge creation and the use of the SECI model will enhance the insights of organisation into their knowledge creation and the process involved in it (Haag et al., 2010, p.43). The use of the SECI model for measuring knowledge creation and sharing in different knowledge-intensive firms in the USA and Spain (e.g. telecommunications, I.T service providers, web search portals, computer and electronic manufacturing, and broadcasting) is widely acknowledged (Martin-de-Castro et al., 2008). Rice and Rice (2005) used the SECI model in the multi-organisational projects in order to measure knowledge capture, sharing and value creation, while Rodrigues et al. (2006) investigated the SECI model in the IT sector.

In terms of the 'universal applicability' of the SECI model as acclaimed by Nonaka in different cultural contexts, the applicability of this model for measuring knowledge creation in Pakistani banks can be questionable (Glisby and Holden, 2003; Andreeva and Ikhilchik, 2011; Haag et al., 2010). Therefore, in order to check that: i) whether the SECI knowledge conversion process is supported within Pakistani banks; ii) whether organisational culture in Pakistani banks has any relationship with knowledge creation process; iii) whether senior management is clear about knowledge management implementation in banks; and iv) whether present banking knowledge management system facilitates knowledge dissemination and smooth process of information accessibility across the branches, this study opted for the SECI model for knowledge creation using Nonaka and Takeuchi (1996) in the context of Pakistani banking organisational culture.

As far as the use of SECI knowledge management process in the banks is concerned, the specific KM process in bank should contain human and technology interfaces for effective knowledge acquisition, transfer, and retention (Ali and Ahmad, 2006; Mizintseva and Gerbina, 2009). For example, the Asian Development Bank (ADB)

implemented human/technology-oriented knowledge management system in June 2004 based on five programs: i) developing bank culture for KM; ii) developing research agenda for KM; iii) updating and integrating business processes and I.T platform for KM; iv) developing communities of practice; and v) encouraging knowledge sharing with internal and external stakeholders (Boom, 2005). In this regards, socialisation and internalisation modes within SECI support human-oriented KM, while externalisation and combination support technology-oriented KM (Maier and Remus, 2003). For example, the socialisation and internalisation processes can be triggered with face to face conversations, on-job-training, mentoring, coaching, communities of practice, teamwork, employee empowerment, and reward and recognition (Vencatachellum and Jeetach, 2008). In contrast, knowledge externalisation and combination processes are associated with information systems and technology in which tacit knowledge converted into explicit knowledge by updating and integrating business processes and IT platform for KM (Maier and Remus, 2003). Henceforth, the theoretical and methodological underpinning of SECI supports the general mechanism of KM in banks thus provides the solid justification for use in this study.

2.10 Organisational Culture and Knowledge Creation Process

In the knowledge creation theory, organisational culture as an antecedent is not assumed. Although, it is generally acclaimed that culture (i.e. in a different context) is a function of knowledge creation (Haag et al., 2010). In order to make the assumption that culture can be a primary antecedent of knowledge creation; we need to look at the nature of both culture and knowledge creation process. Despite the recognition of the influence of culture on effective knowledge management implementation (Janz and Prasarnphanich, 2003); knowledge management practices (Alavi et al., 2006); and knowledge sharing, management and transfer (Schumann and Tittmann, 2010), the relationship between organisational culture and specific knowledge management processes is not investigated (Mueller, 2012).

Historically, Nonaka and Takeuchi (1996) theorise that knowledge is created when both tacit and explicit knowledge are complementing and interfacing each other

through four switching modes; namely, socialisation, externalisation, combination, and internalisation. It is suggested that the basic cognitive process of knowledge conversion between tacit and explicit knowledge is a natural process that is highly dependent on culture and the supporting environment. Nonaka (1994) reported three elements (i.e. intention, autonomy and fluctuation) of the knowledge creation formation process that is likely to induce individual commitment in an organisational setting. Earlier, individual intention was assumed as an attitude that not only was free from any consciousness but also does not regard the subject commitment to an object (Husserl, 1999). Later, it is postulated that the both environmental information and preoccupied frame of judgement are important factors in the knowledge creation process as it increases the individual intention and the degree of meaningfulness (Eigen, 1971).

The cognition process requires individuals, groups and organisational level autonomy (Nonaka, 1994). Thus, cognition is the process of knowing and understanding in which intention facilitates to judge the value of the information (Neisser, 1976). In the knowledge creation process, organisations need to be flexible in acquiring, relating and interpreting information (Morgan, 1997). However, individual autonomy is a complex ingredient that gives individual freedom to absorb knowledge (Nonaka, 1994). Apart from two internally driven knowledge creation elements, fluctuation is more externally driven which is more sensitive to the external environmental forces. It posits that the environmental malfunctions also create new avenues for individuals and organisations to redefine, recreate and reformulate new patterns of solving problems through interaction with the external world (Nonaka, 1994). It is argued that the cognition process is equally driven by internal (intention + autonomy) and external (fluctuation) supporting factors. The argument of Thompson and Walsham (2004) further expands our understanding that the ‘context’ is a great facilitator of knowledge creation. Thus, organisational culture provides that context in which knowledge creation takes place because a particular context is not always helpful in new knowledge creation until and unless factors of success are not considered, and important critical barriers are not removed or changed (Snowden, 2002). In addition, Mingers (2008) reiterated that the inter-

subjectivity is an important requisite for knowledge. The inter-subjectivity is context-specific, or it is highly dependent on a joint context. Knowledge changes with the context. It means knowledge is also context-specific as it loses meaning and relevance if the context changes (Jyrämä and Äyväri, 2007). Therefore, knowledge must be seen as a context-specific, and it cannot be free from context but embedded in it. Mezirow quoted that:

> ...as there are no fixed truths or totally definitive knowledge, and because circumstances change, the human condition may best be understood as a continuous effort to negotiate contested meanings… that is why it is so important adult learning emphasizes contextual understanding, critical reflection on assumptions, and validating meaning by assessing reasons. Transformation theory… adds a fifth and a crucial mode of making meaning: becoming critically aware of one's own tacit assumptions and expectations and those of others and assessing their relevance for making an interpretation. (Mezirow, 2000, p.1-2)

It can be argued that knowledge is intensely embedded in different organisational routines and practices including organisational culture, values, practices, policies, repositories, documents, systems, and memories. It resides in individual assumptions and requires an appropriate state that provides inter-subjectivity in order to be conclusive. Therefore, the importance of organisational culture in the knowledge creation is widely acknowledged. Ponis et al., (2010, p.15) argued that "culture is made up of values, assumptions and beliefs of organisational members that strongly influence whether and how organisational strategies are implemented". It implies that values, assumptions and beliefs facilitate organisational members to invent, discover, or develop their external adaptation and internal integration so as to deal with the problems. In other words, the creation is not the state of being disconnected; rather it is deeply embedded in individual and the environment (Glăveanu, 2010). However, it is somewhat difficult to conceive the creation free from external influence especially in a social setting (Runco, 2004). Therefore, it seems obligatory to comprehend community and shared patterns within which creation is performed. For scholars, it is

always a primary concern to grasp specific ways (or cultural context) in which creation has taken place. The cultural difference may have an influence on the knowledge (or the way people perceive events and objects). It implies that the act of perceiving any objects is subject to culture or cultural values and assumptions. For example, Nisbett et al. (2001) noted that culture determines cognitive processes. It is suggested that:

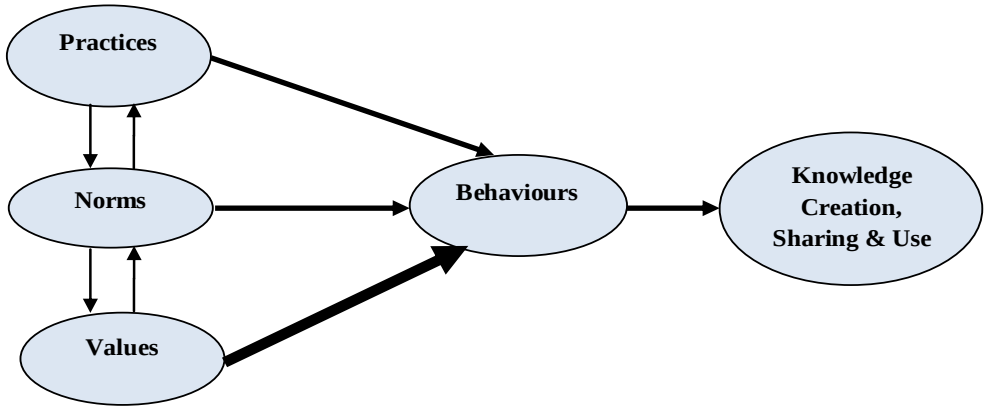
> ...the cognitive processes triggered by a given situation may not be as universal as generally supposed or so divorced from content or so independent of the particular character of thought that distinguishes one human group from another. (Nisbett et al., 2001, p. 306)

In an organisational context, cultural difference and similarities may prevent the act of perceiving any objects on the one side and expedite the entire process on the other. For instance, the social interaction may be the main source in deploying tacit knowledge because the continuous process of sharing and observing life or work experiences through social interaction and replicating these interactions with learning by doing so may be the source of creating new knowledge (Nickols, 2000). Additionally, social interaction typically occurs in an aggregated culture in which members of different ethnic or racial backgrounds share their ideas, emotions and feelings. Hence, strong organisational culture plays an important role in deriving tacit knowledge through continuous social interaction that may be used to uplift knowledge creation, sharing and use.

Moreover, organisational culture offers a mutual system of learning in which people can share and exchange life or work experiences through social interaction. Kitayama et al. (1997, p.1247) found "people's cognitive capacities can be changed if they are exposed to a new host culture." In other words, culture either pacifies the environment in which knowledge creation takes place or it tends to regulate individual behaviour which is important for knowledge creation and exchange. Thus, organisations should provide an environment in which people utilise their cognitive capacities during workplace socialisation for knowledge creation, sharing and use.

The concept of knowledge creation also discussed in terms of individual behaviour. For example, Delong and Fahey (2000) argued that knowledge creation is a behavioural phenomenon as behaviours are playing a mediating role in the knowledge creation process. According to Hagg et al. (2010), culture determines an individual's behaviour whereas behaviour is a result of different sociological forces which has the capability to influence people. It implies that the culture regulates individual behaviour and this regulated behaviour has a tendency to create new knowledge in terms of new ideas, concept, and know-how (Ribiere and Sitar, 2003).

Figure 2.9: Elements of Culture – Delong and Fahey (2000)



Note: The thicker arrow denotes the predominant impact of values on behaviours

More specifically, Delong and Fahey (2000) identified three primary elements of organisational culture; namely, values, norms and practices that directly impact behaviours which, in turn, keep influencing knowledge creation sharing and its utilisation. It is argued that values, norms and practices are fundamentally interconnected at multiple (i.e. top ↔ bottom) levels. Values are deeply rooted and may not be easily expressed, but it would impact on knowledge creation capability because it manipulates individual behaviour that could be the source of useful knowledge creation. Therefore, it suggested that the interplay between norms and values support the desired behaviour which is necessary to create and sustain knowledge creation and sharing capability. It further indicated that, culture demonstrates a specific set of practices which are required in daily routines. Thus, practices symbolically provide a direct lever for change that may be needed to support knowledge creation, sharing, and use.

Moreover, it is strongly conceived that the knowledge creation process not only is 'culturally situated' but stems from a specific cultural context. Also, four SECI knowledge creation modes (socialisation, externalisation, combination, and internalisation) are robustly influenced and created by culture and cultural attributes (Nisbett et al., 2001). Due to the scarcity of literature, an attempt has been made to link up some elements of organisational culture and the four knowledge creation processes at an organisational level for which it was originally intended. More specifically, the answer to the following question: 'How does organisational culture influence knowledge creation capability?' will need to be obtained. Therefore, the objective of this study is to investigate the relationship between organisational culture and knowledge creation process in the Pakistani knowledge-intensive banks. The following section summarises the conceptual and empirical findings based on organisational culture and knowledge creation relationship studies.

2.11 Conceptual and Empirical Findings based on Organisational Culture and Knowledge Creation Studies

According to the mixed-methods survey findings of 1,425 middle managers of 147 Korean companies, a significant relationship between different cultural values and knowledge creation found to be significant. For example, Lee and Choi (2003) empirically investigated the hypothesised relationship between collaboration, learning, trust, and centralisation and knowledge creation process based on socialisation, externalisation, combination, and internalisation. Lee and Choi found that, collaboration is correlated with socialisation, externalisation, and internalisation whereas trust is positively related with all SECI processes. However, centralisation is negatively associated with socialisation, externalisation, and internalisation. On the basis of findings, Lee and Choi (2003) surmised that the knowledge creation is associated with organisation culture factors. Lee and Choi provided a comprehensive framework in order to understand the role of culture in the knowledge creation process. However, it can be questioned how only three organisational culture variables reflect the whole picture of the entire organisational culture in a true sense.

The organisational culture is also treated as a critical factor in creating and reinforcing knowledge management in organisations. Rai (2011) theorised that an ethical and trusting culture plays an important role in efficient knowledge management implementation depending on the culture that exists in an organisation. Rai proposed six propositions and indicated that the application of different dominant cultural styles with the SECI model led to the improvement of knowledge management practices. Thus, it is argued that the importance of various cultural attributes in the knowledge creation process should not be overlooked as it serves as a valuable tool to investigate both the employee knowledge development and organisational knowledge creation process. In addition, various cultural levels also provide a particular foothold to start a knowledge management programme in the organisation. For example, King (2008) conceptually upholds the culture and knowledge management relationship issue at five cultural levels; namely, national culture, organisational culture, organisational climate, organisational subcultures, and team climate. King advocated that knowledge management success, by and large, associated with these five cultural levels.

Haag et al. (2010) also acknowledged the plausibility of the relationship between national, organisational, and individual culture and knowledge creation. Haag et al. (2010, p.43) quoted that "culture and its impact on knowledge creation and the application of the SECI model will enrich the insights of an organisation into knowledge creation, and the processes involved in it." It is, therefore, conceived that the knowledge creation process in the knowledge-intensive organisation can be best described in terms of its supporting societal and organisational conditions. Haag's conceptual model showed that Hofstede and Hofstede's (2005) six cultural levels (e.g. national, organisational, regional, social class, gender and generation) have an impact on SECI knowledge conversion modes. In other words, organisational knowledge creation is a complex process because of multiple reasons. For instance, cultural influence is more contextual; therefore, it is implausible to categorise the knowledge creation process in an organisation using the SECI model. Also, national culture in general and organisational culture in particular (mainly at various levels) is the strongest predictor of knowledge creation, but its impact on organisational

knowledge creation is somehow difficult to validate. It is argued here that, knowledge creation of employee (knowledge worker) in a knowledge-intensive organisation can be better investigated in different organisational culture values that can be intervened with organisational development programmes.

Wang et al. (2011) also found a significant correlation between organisational culture and knowledge creation capability. The quantitative data of 212 Chinese firms used to empirically test the hypotheses indicated that organisation culture informally (e.g. daily routines and practices) impacts on the knowledge creation capability. For this empirical study, the author utilised Hofstede's organisational culture values (i.e. individualism-collectivism, uncertainty-avoidance and power-distance) and found its impact on knowledge creation modes. Wang et al. (2011) empirically investigated that the individualism-collectivism is an essential element of organisational culture. Members in an individualistic culture are relentlessly involved in self-fulfilment of their needs and wants while collectivist culture looks after the interests and benevolence of the group (Wagner, 1995; Hofstede, 2001). Therefore, individualism stimulates personal motive; therefore, employees in individualist organisations are often reluctant to share or exchange knowledge with others (Wang et al., 2011). The individualistic behaviour not only offsets knowledge management initiatives but also abolishes the active knowledge creation process. In contrast, the collectivism has found to be a positive predictor for knowledge creation. Thus, a collectivist organisation is a powerful enabler for knowledge sharing and exchange as it encourages cooperation and teamwork that could be significant in the knowledge creation process (Wagner, 1995; Smith et al., 2005; Wang et al., 2011).

Wang et al., (2011) empirically found a negative correlation between uncertainty avoidance and knowledge creation capability. They argued that employees working with low uncertainty avoidance in organisations are more responsive than a high uncertainty avoidance employee. People in low uncertainty avoidance organisations usually take more risk, tolerate adverse attitude and lessen the likelihood of such situations in which ambiguity is prevailing. Therefore, knowledge creation is higher in low uncertainty avoidance organisations than high uncertainty avoidance

organisations; whereas, employees with high uncertainty avoidance culture normally keep away from complexity and ambiguity (Hofstede, 2001). People in low uncertainty avoidance cultures have a stronger inspiration to create new knowledge and develop their knowledge creation capabilities than those who are high in uncertainty avoidance cultures.

The empirical study also found a negative association between power distance and knowledge creation capability (Wang et al., 2011). They argued that high power distance is a trait that regulates individual activities and restrains employees to make creative decisions (Shane, 1995). It is improbable that people who are working with high power distance organisations are led to create new knowledge rather than stay focused on assigned tasks and activities. Likewise, people working in low power distance organisations have more autonomy to perform creative tasks and are involved in exchange and combined knowledge (Bates et al., 1995). In addition, people in low power distance organisations encourage socialisation; consequently, they feel motivated to be involved in the interaction with others and that leads them to enhance knowledge sharing and exchange (Çakar and Ertürk, 2010). Therefore, high power distance culture hampers knowledge exchange and combination and restrains them from knowledge creation and the knowledge management process. It is argued here that national culture values should not be used for measuring knowledge creation in organisational context due to multiple reasons. Firstly, national culture could not represent organisational culture in different contextual conditions. Secondly, national culture could not measure knowledge management implementation and use in the organisations.

In another empirical study, Kao et al., (2011) found that the unique organisational culture with both hierarchy culture (e.g. rules, regulations and procedures) and clan culture (e.g. cohesiveness, participation, and teamwork) is more likely to enhance the knowledge creation process. The data findings obtained from 153 manufacturing companies indicated that workplace cohesiveness, participation, and teamwork are negatively correlated with product and manufacturing creation capability. However, three factors (i.e. cultural embeddedness, workplace inter-connectedness and

employee trustworthiness) have positive correlation with management creation capability.

The structural analysis result of the questionnaire survey obtained from 813 corporate sector employees at different managerial positions in Pakistan showed a significant variance in terms of knowledge management implementation and use (Saeed et al., 2010). Even though the empirical findings indicated a significant relationship between three cultural dimensions (i.e. collaboration, formalisation, and trust and knowledge management practices) in the Pakistani corporate sector, Saeed et al. (2010) concluded that the predicting role of organisational culture in knowledge management success is not overwhelming because of the lack of management interest and support.

The structural equation analysis result of another mixed-methods survey obtained from 384 HR professionals in two HR organisations showed that the organisational culture strongly supported knowledge management in the organisation (Zheng et al., 2010). Zheng concluded that organisational culture values (adaptability, consistency, mission, and involvement) determine the way through which knowledge creation, sharing, and utilisation takes place in the organisation.

In a recent study, Li (2013) used a structural equation analysis for hypothesis testing to find the relationship between SECI modes and Denison's organisational culture indexes. The questionnaire survey data was obtained from 33 bank managers in 18 Chinese commercial banks and found a great and positive effect of organisational culture values (involvement, consistency, adaptability, and mission) on knowledge management using the SECI model. On the basis of her findings, Li (2013) posits that the different cultural values contribute differently to SECI modes. However, Li left the ambiguity in her empirical model while taking KM as a framework; not as a process.

In conclusion, organisational culture in different domains influences the process of knowledge creation and sharing at both individual and organisational levels. An

organisational culture derives from the ‘imposed organisational structure’ and the ‘personalities of the individual employee likely to create, share and exchange knowledge during performing tasks and activities (Denison et al., 2004). In other words, the imposed organisational structure such as corporate strategy (e.g. vision and strategic direction and intent); structure (empowerment, coordination and integration); process (team orientation and capability development); human resource policy (organisational learning and goals and objectives); and core corporate values affects the way with which people interact, create and exchange information. It is argued here that culture is a complex concept somehow difficult to describe. In a different context, it can mean a lot of things to different people. Therefore, organisations are constrained to revisit their culture in general and knowledge management policies in particular because they might be the biggest impediment in promoting knowledge culture within organisations. In the proposed study, an attempt has been made to understand the dynamics of banking culture and its impact on knowledge creation of employees as it helps managers to understand the connections between culture and the knowledge creation process.

2.12 Survey Instrument Design

The development and design of a contextually appropriate and unique survey is a duteous process (Churchill, 1991). A well designed survey and the interview questions about a particular study intend to achieve research aim and objectives and provide information that is useful for data analysis. In this study, the final design of the survey instrument was based on the existing literature in the surrounding domain of organisational culture and knowledge creation.

Empirically, a set of a validated survey question and the explicit rationale of each question in the questionnaire have a major impact on the data quality. Therefore, the measurement of the selected variables could be commendably accomplished through the implementation, and subsequent revision of the validated measures. The use of validated measures in the original research work imparts various significant advantages (Hyman et al., 2006 and Dale, 2006). For example, it not only confirms the reliability or consistency of the results in the original work but also legitimise the

instrument from which it was originally adopted. In addition, the use of previously validated measures also minimise the time and cost required to develop a new survey, although it permits researchers to deal with any previously uncovered administrative issues.

Table 2.4: Established Scales on Organisational Culture

Author (Year)	Domain	Cultural Dimensions
Cooke and Lafferty, (1989)	Behavioural norms	Constructive styles, passive/defensive styles, and aggressive/defensive
Woodcock and Francis, (1989)	Organisational values	Power, eclecticism, rewards, effectiveness, efficiency, economy, fairness, teamwork, law and order, defence, competitiveness, opportunism
Hofstede et al., (1990)	National culture	Process vs. results orientation, employee vs. Job orientation, parochial vs. professional orientation, open system vs. closed system, loose vs. tight, and normative vs. Pragmatic
Ashkanasy et al., (2000)	Innovative leadership and rules orientation	Leadership, structure, innovation, job performance, planning, communication, environment, humanistic workplace, individual development, socialisation and entry
Sarros et al., (2005)	Person-organisation Fit and organisational selection decisions	Innovation, attention to detail, outcome orientation, aggressiveness, supportiveness, emphasis on rewards, team orientation, and decisiveness
Denison et al., (2006)	Organisational culture	Involvement, consistency, adaptability and mission
Cameron and Quinn, (2011)	Culture types	Market, adhocracy, hierarchy and clan

In this mixed-methods study, the researcher borrowed two previously established scales. However, the pilot study (see Section 4.8) utilised in a formal way and initial draft of both quantitative and qualitative questionnaires refined through systematic use of pilots. Thus, the researcher examined the questions that were used by other surveys on a similar topic and received help from the experts in the fields before finalising an initial draft of the questionnaire. In addition, the wording of the each question kept clear and all the questions kept sequenced logically. The questions designed in such a way that they can be answered accurately by the respondents and only those surveys were considered that ensured the reliability and validity in the final scales. Following discussion summarises the detail of survey instrument design of the both organisational culture and knowledge creation scales used in the study.

As stated, the researcher borrowed two validated scales. The first intends to measure the organisational culture. The final selection of the validated organisational culture scale made on the basis of the explicit rationale of each survey question in the organisational culture dimension and their impact on the data quality. Theoretically, an attempt has been made to rationalise the use of various organisational culture dimensions in banking organisations for investigating their relationship with knowledge creation in Pakistani banks. For this measure, the researcher browsed through different databases and thoroughly evaluated the seven (see Table 2.4) organisational culture scales published between 1987 and 2011.

Table 2.5: Relative Framework of Organisational Values

Organisational Values Based on Scales developed in the West	Organisational Values Based on the 'Value Statement' of Seventeen Banks	Organisational Values Based on Denison's Culture Scale
Respect, flexibility, dependability, generosity, empowerment, responsibility, competency, quality, persistence, influence, agreement, independence, interdependence, strategic intent, empathy, honesty, credibility, capability development, fun, dignity, learning, discipline, integrity, efficiency, focus, innovativeness, collaboration, loyalty, teamwork, accomplishment, security, stewardship, improvement, goal orientation, equality, diversity, optimism, empowerment, dedication, courage, service, challenge, wisdom, excellence, friendliness, accountability, ambition, accuracy, compassion and individuality, vision, etc.	Equal opportunities, teamwork, loyalty, corporate governance, capability enhancement, value creation, integrity, learning and development, challenge, goal alignment, fairness, vision, innovativeness, service, meritocracy, performance culture, honest leadership, customer focus	Empowerment, team orientation, capability development, core values, agreement, coordination and integration, creating change, customer focus, organisational learning, strategic direction and intent, goals and objectives, vision

However, organisational culture scale developed by Denison, Janovics, Young and Cho (2006), finally selected for this study. The survey instrument is made up of four organisational culture traits: involvement, consistency, adaptability, and mission. From these scales, the organisational culture scale developed by Denison and fellows deemed most relevant in terms of combining both quantitative and qualitative methods to examine the cultural characteristics of high and low performing

organisations (e.g. Fey and Denison, 2003; Haaland and Goelzer, 2003; Denison and Mishra, 1995; Denison, 1990 and Denison, 1984). The Denison's organisational culture scale chosen above has an ability to measure the group behaviour in all levels of organisation including the deepest (lowest) organisational level. For example, the Denison's culture definition disintegrates the organisational and individualistic factors in two different dimensions. The organisational factor emphasises the policies, procedures, and structures while the individualistic dimension delineates the related norms, beliefs, values and assumptions shared by members. Therefore, Denison's developed scale used to measure organisational culture in different organisational levels of Pakistani banks.

In order to decide which organisational culture value(s) can be best employed for measuring knowledge creation process in the Pakistani banking organisations, a relative framework of organisational values comprising organisational values based on scales developed in the west, organisational values based on the 'value statement' of seventeen banks, and organisational values based on Denison's organisational culture scale compared and contrasted. As shown in Table 2.5, three sets of organisational values are enlisted. The first column shows organisational values based on the scales developed in the west; the second column shows organisational values based on seventeen value statements of banking organisations in Pakistan; and the third column shows organisational values based on Denison's organisational culture model. The researcher found that almost all of the organisational values which are obtained through the value statement of banking organisations were not only present in the established scales of organisational culture reviewed for this study but these were also cited and explained in Denison's cultural model. Therefore, Denison's twelve cultural values deemed relevant for measuring the empirical relationships between independent and dependent variables in this study.

In terms of validity, the 60 Likert-scale items for measuring organisational culture through four traits and 12 indexes strongly supports the predictive validity results than other instruments. For example, the organisational culture scale established by Denison also provided a strong cross-cultural validity through scale validation on a

fairly hefty sample of 35,474 individuals obtained from 160 different organisations in twelve European and Asian countries. The cross-cultural demographic characteristics of the sample showed that out of the twelve countries and 160 organisations, 1.3% of the sample obtained were from two organisations in Asian countries. Likewise, out of twelve industries, 10.6% of the sample was obtained from an organisation in the financial sector. In addition to that, Denison (2006) provided a strong index and item validity of the total of twelve indexes ($4 \times 3 = 12$) for each attribute and five items ($12 \times 5 = 60$) for each index. The co-efficient alpha values for the twelve indexes ranged from 0.70 to 0.85 signifying a suitable level of internal consistency. Similarly, the results of chi-square and fit indices also confirmed the close fit for the specified model. With regards to the validity of the results, GFI (0.88), AGFI (0.87), CFI (0.98) and RMSEA (0.048) values suggest that the underlying model significantly established the relationship between the items assembled for the culture assessment (Denison et al., 2006).

A second scale is borrowed for the measurement of knowledge creation process. For this measure, twenty four-item scale is taken from Song et al., (2010). The second measurement required for the quantitative element of this mixed-methods study involves 'organisational culture and its impact on knowledge creation and the use of the SECI model for knowledge creation and the process involved in it' (Haag et al., 2010, p.43). In knowledge creation theory, SECI process based on four modes provides a distinctive framework that broadly covers sharing and creation process (Earl, 2001; Von Krogh et al., 2000a; Haag et al., 2010). Therefore, SECI model for measuring the knowledge creation process based on four knowledge creation modes namely: socialisation, externalisation, combination, and internalisation taken for item specification in the context of knowledge-intensive banking organisations (Hinkin, 2005 and Song et al., 2011). For this measure, the four modes of the SECI process are taken as the appropriate measuring criteria in knowledge-intensive organisational set-up (Nonaka et al., 1995). As, the socialisation and internalisation modes facilitate human-oriented KM, while externalisation and combination support technology-oriented KM (Maier and Remus, 2003). For example, the socialisation and internalisation process can be triggered with face to face conversations, on-the-job-

training, mentoring, coaching, communities of practice, teamwork, employee empowerment, and reward and recognition (Vencatachellum and Jeetach, 2008). In contrast, the knowledge externalisation and combination process are associated with information systems and technology in which tacit knowledge is converted into explicit knowledge by updating and integrating business processes and I.T platform for KM (Maier and Remus, 2003).

Table 2.6: Established Scales on Knowledge Creation

Author (Year)	Domain	Knowledge Modes
Huang and Wang (2002)	Knowledge Creation and Performance in Teams	Team innovation effectiveness, knowledge transfer, knowledge creation, R&D performance
Chou and Tsai (2004)	Individual and Organisational Knowledge	Knowledge Creation 'ba'
Tsai and Li (2007)	Knowledge Creation Process	Socialisation, externalisation, combination, and internalisation
Li et al., (2009)	Knowledge Creation Process	Socialisation, externalisation, combination, and internalization
Song et al., (2011)	Knowledge Creation and Performance Improvement	Socialisation, externalisation, combination, and internalization
Kao et al., (2011)	Knowledge Creation Modes	Goal free and goal-framed knowledge creation modes

The twenty four item knowledge creation scale developed by Song et al. (2011) adopted in this study provides an appropriate and effective measurement scale for the knowledge creation process. This scale covers the four knowledge creation processes based on Nonaka's knowledge creation theory namely: socialisation, externalisation, combination, and externalisation. The Song et al. (2011) scale is considered appropriate than others for empirical testing in the knowledge management literature due to its grounding in the theory that embraces many models and comportments expected of top level management, middle level managers, and front line employees within organisation for instigating and exploring and exploiting knowledge assets. Hence, all the items offer a practical instrument to measure organisational knowledge creation process, and the core behaviours deemed required for exploring and exploiting of organisational knowledge creation at tactical, operational and technical development purposes (Song et al., 2011, p.245).

However, a detailed literature review was carried out during the process of final selection of the knowledge creation scale. For this, the researcher thoroughly

assessed previous established scales (see Table 2.6) published between the period of 2002 and 2011. For this, only those knowledge creation scales were considered that developed deductively in which Nonaka's SECI knowledge creation theory was taken for theoretical background and item specifications. Also, the researcher has considered only those scales that ensured the reliability and validity in the final scales, and showed relevance within the Pakistani banking context. However, a lack of empirically validated scales for measuring knowledge creation in Pakistani banking organisational context may also create certain validity issues (DeVellis, 2003; Thompson, 2004; Song et al., 2011). Therefore, the validity of the scale was established in the pilot study (see Sections 5.6.1 and 5.6.2) and post-hoc scale development phases before hypothesis testing.

Apart from both measurement scales, a set of demographic data also obtained from the respondents in terms of sample composition. Thus the demographic data obtained in terms of employee highest degree, employee job rank, employee job functions, length of service with current employer, and the number of trainings received. All respondents asked a chain of personal and categorical questions in order to determine the appropriateness for inclusion in the study and the analyses of control variables to support cause and affect relationships. However, in order to deal with the issue of terminology, the formatting of the survey questions in the typical Likert scale also allows researchers to get the benefit of pre-coding and provide information that is useful for data analysis (Bryman and Bell, 2007). Therefore, a 5-point Likert scale used throughout in the questionnaire, thus permit researcher to obtain more valid responses in the process of analysis. For quantitative analysis, all the quantitative data is processed through SPSS software and IBM Amos v19. Firstly, personal and categorical data are analysed. Thereafter, frequency distribution, descriptive data and data normality of the survey results are summarised. Before reporting confirmatory factor analysis (CFA) results, the non-response bias between paper and electronic survey responses are assessed.

2.13 Summary

In this chapter, the theoretical and empirical literature in the field of organisational culture and knowledge creation research is categorically reviewed. The review of related literature helps the researcher to identify gaps in the extant literature, to formulate research questions, to make the decision of methodological choice, and to design the overall project. For this study, the ultimate aspiration behind this literature review was to provide a solid underpinning to the underlying problem statement. For this purpose, this chapter focuses on theoretical and empirical aspects of organisational culture and knowledge creation research. For example, on the theoretical side, this chapter has reviewed the fundamentals of knowledge with the help of numerous key definitions and concepts, definitions of organisational culture and the diverse perspectives of organisational culture, and cultural perspectives of knowledge creation. However, on the empirical side, related epistemological models of knowledge creation discussed briefly.

CHAPTER 3

THEORETICAL FRAMEWORK & HYPOTHESES OF STUDY

3.1 Introduction

The literature review presented in the last chapter recognises the critical areas in knowledge creation research and evaluates the relevancy (degree of fit) of these areas in the banking organisation's context. A literature review has revealed two main facets of the knowledge management research: a) management and organisation and b) knowledge management technology. The management and organisation potentially responsible for the development of knowledge management system and subsequently enhance the knowledge and learning culture whereas knowledge management technology facilitates knowledge creation and sharing in the organisations. The knowledge management literature also unveiled two streams of research. First stream inculcates the tacit versus explicit knowledge while the second stream instigates intellectual capital (Travica, 2013). In spite of two different streams, the mainstream research focused on the development of the knowledge management frameworks (Nonaka and Takeuchi, 1996; Hertog and Huizenga, 2000; Argote et al., 2003). In this connection, the relationship between organisational culture and knowledge management has been widely acknowledged (Travica, 2013; Rai, 2011; Kao et al., 2011; King, 2008; Lai and Lee, 2007; Oliver and Kandadi; 2006, De Long Fahey, 2000; McDermott and O'Dell, 2001 and Knapp and Yu, 1999). However, Travica (2013, p.88) wrote that "the process approach has been influential in the fundamental knowledge management research."

In spite of the recognition of the influence of culture on effective knowledge management implementation (Janz and Prasarnphanich, 2003), knowledge management practices Alavi et al., (2006) and knowledge sharing, management and transfer (Schumann and Tittmann, 2010), the relationship between organisational culture and specific knowledge management processes were not investigated (Mueller, 2012). Therefore, motivated by the theme that the culture and its impact on knowledge creation and the use of the SECI model will enhance the insight of an organisation into their knowledge creation and the processes involved in it (Haag et

al., 2010, p.43). The aim of underlying empirical study (see Section 1.5) is to investigate the relationship between organisational culture and knowledge creation process based on socialisation, externalisation, combination, and internalisation. However, as mentioned in section 2.1.4, this study has opted Denison's organisational culture scale based on four values. Therefore, following discussion summarises the role of involvement, consistency, adaptability, and mission cultures in knowledge creation process followed by hypotheses of this study based on the ten culture indexes used in the Denison culture model.

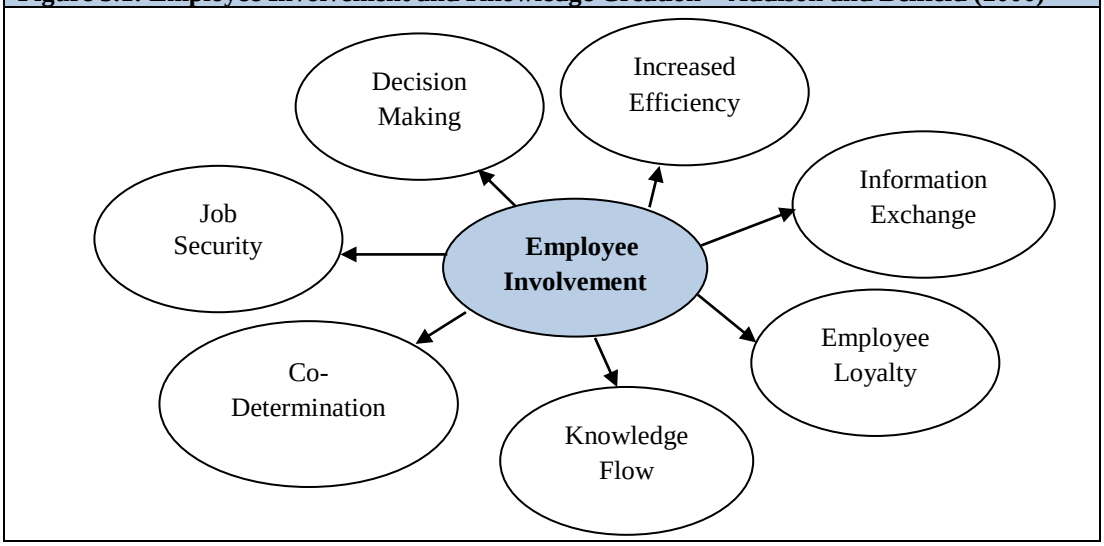
3.1.1 Role of Organisational Involvement

Denison et al. (2006, p.4) noted "highly involved organisations create a sense of ownership and responsibility. Out of this sense of ownership grow a greater commitment to the organisation and an increased capacity for autonomy." Historically, the concept of employee involvement has been emerged as an important factor of human resource management in last two decades. Prominent researchers, for example, Deery (2008); Freeman and Kleiner (2005) and Spreitzer et al., (1999) have found a strong correlation between employee involvement and employee job satisfaction, low employee turnover rate, high job performance and increased organisational productivity. It argued here that the employee involvement encourages mutual respect and employee willingness to take responsibility (Buckingham and Coffman, 1999). Therefore, an employee involvement plausibly enhances employee job satisfaction that leads to improve productivity through work intensification. Because, more satisfied workers love to work longer and harder and do not feel infuriation during routine course of actions (Morehead et al., 1997).

In addition, Kandathil and Varman, (2007) cited form Dachler and Wilpert (1978, p.69) that the "involvement is a multidimensional and dynamic social phenomenon." In the line of this argument, the researcher can assume that, employee involvement programs can't be prolific unless workers recognised that their expectations are fully satisfied, and management showing unconditional support in order to implement a variety of employee participation programs and integrate those programs into the mainstream of the organisational decision making process. Since, various employee

involvement programs and management philosophies are practically employed for creating a sense of ownership amid workers in order to strengthen their decision making skills towards achievement of organisational goals and objectives. In this regards, Lawler's (1992) employee involvement theory considers as an important contribution which indicates that organisations should be planned from top to bottom so that employees able to involve in the business of the organisation.

Figure 3.1: Employee Involvement and Knowledge Creation – Addison and Belfield (2000)



Despite this, literature does not provide any empirical evidence that supports the relationship between employee involvement and knowledge creation process, but it found that the employee involvement mediates the knowledge creation process. For example, Mackie et al. (2001, p.9) quoted "employee involvement practices, through increasing sharing of information, increasing skills and knowledge, and redistributing power, should reduce work stress through providing greater utilisation of skills, increased personal control, less role ambiguity, and increasing participation in decision-making." Hence, employee involvement intensifies emotional or personal association that eventually increases the individuals' sense of knowing and ability of comprehension (White, 1959).

Furthermore, in support of aforesaid arguments it might be worth mentioning to quote Addison and Belfield (2000) findings. As shown in Figure 3.1, the employee involvement practices not only enhance workplace efficiency and decisiveness in solving problems, but it also pretends to keep the knowledge flowing in which

individuals are allowed to provide useful ideas into routine tasks and activities. Since, employee role in the management of a company (especially in policy making) to some extent has increased decision making skills and employee loyalty which is the best ingredient of employee knowledge creation capability. It further indicates that, employee involvement conceivably empowers workers in decision making process thus greater control over their workplace performance. For example, it increases the sense of ownership and job commitment that escort workplace autonomy and employee goal alignment (Spreitzer et al., 1999). Conceptually, high employee involvement is likely to improve decision making ability as it posits that the sharing and creating new knowledge is more discernible in high empowered workers than that of less empowered workers (Vandenberg et al., 1999). Therefore, one can assume that high employee involvement may be the driving force for sharing and creating information or employee knowledge creation capability. Since, the literature has given prudent justification of knowledge creation in the context of high employee involvement.

Needless to say that, in the area of knowledge creation the role of employee involvement has been slightly addressed. For example, Kandathil and Varman (2007) indicated that, employee commitment is of key importance in the process of information sharing because employees who are strongly involved with their job not only possess high levels of confidence but also show high level of vigour in information sharing and use. It is also mentioned that, high employee involvement is a win-win approach for organisations and employees as it reinforces employee commitment and job satisfaction, but it is undecided that how an employee involvement is positively correlated with knowledge creation. However, it is yet undecided that what sort of information or knowledge can flow? What are its antecedents? Additionally, researchers only assumed that, workplace power, information, rewards and knowledge can be an antecedent for keeping an effective knowledge sharing and creation in the organisation.

3.1.2 Role of Organisational Consistency

According to Denison et al. (2006, p.5) "consistency provides a central source of integration, coordination and control, and helps organisations develop a set of systems that create an internal system of governance based on consensual support." Every organisation contains a unique culture that influences routine organisational activities (Chang and Lee, 2007). It not only characterises the character of an organisation to a certain extent, but also characterises the behaviour and attitude of the employee (Ribiere and Sitar, 2003). For instance, Festinger (1962, p.48) mentioned in the theory of cognitive dissonance that "discomfort of cognitive dissonance occurs when things fall out of the alignment, which leads them to get the maximum level of consistency." It further implies that, people possess an inherent desire of consistency which is than utilise in terms of performing certain tasks or activities.

More specifically, people need to be consistent in routine affairs while organisations need consistency in the decision making process. According to Saffold (1988) organisational effectiveness may be tied with consistent and well integrated internal system of governance. Therefore, organisational consistency is considered as an essential organisational tool that can attain stability and internal integration through escalating values, beliefs and assumptions (Denison et al., 2006). In other words, consistency in routine performances can likely to increase organisational efficacy because it resolves disagreement and uplift coordination and integration (Becker et al., 2005). Turner and Rindova (2012) also emphasised that organisational efficiency merely depends on consistent performance in which employees across all hierarchical levels share and create information for performing routine tasks and activities. However, Spender (2007) indicated that, consistency in a personal behaviour may be influenced by organisational rules, standards and culture. Argandoña (2008) also endorsed the same notion by arguing that the consistency in personal behaviour plays an important role in order to substantiate and interpret individual knowledge and its domain.

In addition, organisational consistency is the basis for a strong culture in which organisations build an internal system of governance based on consensual support (Denison et al., 2006). In other words, organisational consistency is an important factor for developing a strong organisational culture in which employee knowledge and belief grow and sustained only and only if organisations provide more effective, consistent and well integrated system of values (Kotter, 2008). Literature also revealed that, organisational long term sustainability is contingent to the attainment of organisational goals that require tangible and intangible resources. Nevertheless, organisational goals can only be attained through a clear set of values, agreement on difficult issues especially when problems arise and coordination and integration in performing tasks and activities. These organisational goals can only be attained through the combined efforts of all stakeholders. For this, employees' and managers not only work together, share and exchange ideas and coordinate their actions, but also integrate organisational internal systems based on mutual support and consent of all stakeholders.

In other words, organisational efficiency merely depends on consistent performance in which employees across all hierarchical levels share and creates information for performing routine tasks and activities (Turner and Rindova, 2012). Therefore, by engaging people in dialogue not only increase their understanding with problems, but it also develops systems that may help employees make consistent decisions and behave in a consistent manner. It is, however, assumed that the knowledge creation process grow and sustain if organisations develop consistent and well integrated system of governance based on core values, coordination and integration and agreement.

It is argued that, all of the organisational tasks and activities can be performed through social interaction of all members which is the fundamental condition in knowledge creation using four SECI knowledge conversion modes. Since, every knowledge-intensive organisation is structured by a group of people who create, share and disseminate information or creates knowledge through action and interaction (Denison et al., 2006 and Nonaka et al., 2000). It is, however, argued that

the organisational tasks and activities can be performed through social interaction of all members in which organisational consistency facilitates members make consistent decisions and performs in a consistent manner. In the socialisation mode, the direct sharing of experiences among colleagues may be increased when people are engaging in dialogue and getting multiple perspectives on the issues. Thus, the three consistency culture indexes mentioned by Denison et al., (2006) are likely to support the socialisation process in knowledge creation. In the externalisation mode, a clear set of core values about knowledge accessibility and transfer support externalisation process help concept creation easier. It is argued that the organisational consistency likely to contribute to the process of concept creation in the externalisation mode. In the combination mode, people exchanging and combining knowledge in tangible or intangible form, collect new information and organise ambiguous concepts into the structure. It is argued that the three organisational consistency indexes are helpful in converting unorganised thoughts into more meaningful concepts. In the internalisation mode, knowledge becomes valuable when it is internalised in individuals' tacit knowledge bases through shared mental models or technical know-how. It is argued that the organisational consistency is through three indexes directly impact the internalisation of knowledge at the individual level.

3.1.3 Role of Organisational Adaptability

Organisational adaptability is the extent to which an organisation recognises and reacts to the environment and stakeholders that reconstitutes and reformulates priorities that allow them to adapt (Denison et al., 2006). In today's dynamic world, every organisation is tottering on the rim of inconsistencies, except it rapidly changes itself before the change will change it (Hamel and Breen, 2007). Savickas (1997) quoted three major components of adaptability i.e. proactive attitude, self and environmental scanning and informed decision making (Savickas, 1997). In a post globalisation scenario, long term organisational success and sustainability is subject to [5] 'technological utopianism' because it promotes technology with the help of

[5] The term technological utopianism derived from the belief in technology conceived as more than tools and machines alone as the means of achieving a 'perfect' society in the near future. Such a society, moreover, would not only be the culmination of the introduction of new tools and machines; it would also be modelled on those tools and machines in its institutions, values and culture.

enriched organisational values and culture. In such situation, new and improved ways to do the work are continually adopted, and workers are coerced to adapt to changing environments. Since, change does not take place in a vacuum. Thus, employees are not only provoked by management to learn to adapt these changes but also encouraged and rewarded (Bass, 2000). In the literature, the correlation between organisational adaptability and knowledge creation is not thoroughly debated while lack of empirical evidence also indicates this hypothesis more alluding. However, Senge (2006) postulated the importance of organisational adaptability when change becomes a threat. Author also indicated that, organisational change is a constant phenomenon in which employees learn to adapt changes through knowledge creation, sharing and use.

Arguably, learning is an important facet in knowledge intensive organisation in which greater emphasis is placed on knowledge creation and sharing. Employee cognitive skill is an important factor of job performance. It is argued that, an employee's job effectiveness is strongly tied with ability to infer, diagnose and judge (Lipnack and Stamps, 2008). Thus, without developing cognitive skills, employee falls behind the required level of performance because they are not able to integrate new information on a routine basis. Therefore, organisational adaptability or the ability to recognise and reacts to the environmental threats and opportunities requires that the people collect necessary information from the internal and external environment, encourage others to express their information and develop new ideas through constructive dialogue in teams.

In other words, organisational adaptability is highly valued in knowledge-intensive organisations and the correlation between the both may be somewhat plausible. Besides this, we are still confused about the statistical significance of such correlation. Therefore, the impetus has developed to statistically validate such hypothesis in this study. Additionally, in most of the organisations cooperation and teamwork across different parts is actively encouraged so that, team members share the newly developed concepts with the entire organisation to evaluate the value of the concepts. Since, team based job culture and performance objectives indicated that

the organisational readiness to change (or organisational adaptability) create a knowledge culture in the organisations. More specifically, organisational adaptability as a cultural value helps organisational members to promote their knowledge capability especially in a changing environment (DeNisi et al., 2003). It is argued that the organisational adaptability likely to impact knowledge creation capability of employees in the context of banking organisations. In the socialisation mode, the direct sharing of experiences among colleagues may be increased when organisations welcome new ideas and try new approaches to doing things. In the externalisation mode, the process of concept creation becomes more rapid with an organisational learning. In the combination mode, combining new and old knowledge help employees to seek new and improved ways to meet customer expectations. In the internalisation mode, continuous organisational change and learning increase individuals' tacit knowledge bases through shared mental models or technical know-how. It is, therefore, argued that the external focused organisational adaptability culture through three indexes directly impact the knowledge creation using SECI modes.

3.1.4 Role of Organisational Mission

Despite two different explanations whether knowledge can be managed Von-Krogh et al., (2000) or not managed Maasdorp (2002), knowledge management theorists agreed upon the fact that, different organisational activities positively affect knowledge creation process under 'senior management support' and well aligned 'knowledge vision' of the organisation. Paradoxically, the proposition of 'knowledge vision' was not new in the literature as it remained part of the core company paradigms in shape of strategic intent, vision or mission, strategies and core values (Von Krogh et al, 2000b). For example, Bratianu (2010, p.45) wrote that "knowledge vision is an integral part of the strategic vision of the firm that determine the purpose of existence and gives a direction to the process of knowledge creation." The knowledge creation process is now considered as an important element of organisational vision as it aligns organisational members with the knowledge transfer process of dialogue and practice. It is argued here that, organisational knowledge can be captured in organisational routines, procedures, processes, system's rules, and

culture. Therefore, it would be imperative to understand those factors in which knowledge can be created, shared and utilised.

However, in order to align organisational members with core knowledge creation and sharing principles, organisational mission can be an influential document that creates balance between the components of a formal system of corporations. It helps to drive the activities of organisation members and used to direct, evaluate and monitor their performance. Bryson (2011, p.11) indicated "mission statements, if not integrated into a rational practice or set of practices along with mental activities, strategic activities, tacit knowledge and emotions are "things" or "artefacts" that do not necessarily produce positive results." Hence, this argument categorically endorsed our conviction to suggest a hypothesis that, organisational mission has a statistically significant impact on the knowledge creation process in the organisation. Because, organisations design their mission statements in line with employees mental activities (e.g. beliefs or assumptions) and this inter-connectivity lead them to produce new ideas or knowledge.

It also suggested that the well aligned strategic direction, clear goals and objectives and organisational vision are often intentionally formed to invigorate employees' thinking process (Bryson, 2011). Therefore, strategic direction should not be perceived merely as an object, but it should be shared one as top leadership has to ascertain its good fit with organisation members to enhance the commitment and motivation toward attaining higher order goals (Bogler, 2001). Likewise, if the mission statement is appropriately incorporated with the philosophy and ideology of the organisation then it could serve as a 'general reference point' that will ultimately direct the organisation members towards the accomplishment of goals (Bogler, 2001). Undoubtedly, vision and visionary leadership supposed to establish a sense of motivation that elevates organisations towards productivity on the one hand and invigorates employee satisfaction on the other (Kantabutra, 2009). Literature review also unfolded certain connecting dots that corroborate the impact of vision on the creation of new ideas. For example, Zaccaro and Banks (2001) aptly acknowledge this as 'self-identification with vision'. Since, it may be pertinent here to argue that

organisation members share organisation vision as 'schema' (Kotter, 1982) or regard this as a 'course of action' of what needs to be achieved (Baum et al., 1998). Therefore, 'vision assimilation' is considered as an important antecedent that not only regarded and shared with key stakeholders, but it signifies the interests and the anticipations of the followers and managers (Bogler, 2001). Until 1990, various HRD functions were evolved and the notion of firm's strategic direction has been emerged as a basic part of HRD that inflicted numerous implications related to the strategic area. One such implication was the implementation of a strategic system for managing knowledge (Aliaga, 2000). Correspondingly, this paradigm shift has diverted management attention towards achieving long-term sustainability by removing organisational obstacles to creativity (Lusch et al., 1998) which means facilitating changes in the organisational culture, cultural values and employees' beliefs for managing knowledge (Aliaga, 2000). Most importantly, Jarzabkowski hypothesised that:

> …implementation of an effective, strategic, system for managing knowledge could increase employee knowledge creation capability because this cultural attribute will expand employees' strategic choice which is essentially implanted in social structures or socialisation process that ought to produce, reproduced and shaped by individual and group actions or activities. (Jarzabkowski, 2008, p.633)

Hence, it can be argued that, an effective, strategic system could create a positive force field amid organisation in general as well as employees' in particular to create, transform and disseminate new knowledge. Likewise, knowledge in both shapes (e.g. tacit or explicit) deciphered into workplace activities, and it can be produced or created by understanding through achieving the purpose of the entire enterprise or its parts (Bryson, 2011). Therefore, researcher believe that the organisational mission statement must allow some space for knowledge workers in which they can easily get through likely (or unlikely) limitations and restrictions imposed by prevailing information that prevent them from attaining a new perception, a new observation of the environment and new knowledge. It is argued that, when people know where they

are going, knowledge creation would grow and sustain. In other words, employee mission using three indexes (i.e. strategic direction & intent, goals & objectives and vision) is positively correlated with four knowledge creation process based on socialisation, externalisation, combination, and internalisation.

3.2 Hypotheses of Study

Although, the existing literature is lacking in terms of empirical investigation, the related literature has shown the close interrelatedness and the interrelationship between selected variables and proper fit of the theoretical model. Theoretically, the relevant literature identifies **empowerment, team orientation, capability development, core values, agreement, coordination & integration, organisational learning, organisational change, strategic direction & intent, goals & objectives and vision** as key elements of organisational culture in explaining variance in the contextually suitable variable of knowledge creation process. In order to understand the complex relationships between organisational culture and knowledge creation process in knowledge intensive banking organisations and to address the quantitative strand of the mixed-methods question (i.e. what may be the relationship between organisational culture and knowledge creation process?) theoretical framework have been developed and following ten hypotheses have been drawn on the basis of deductive reasoning (i.e. theory → hypothesis → observation → confirmation) on the nature and direction of these relationships. The following section summarises the hypotheses of this study in more detail.

3.2.1 Empowerment and Knowledge Creation Process

The deployment of individual autonomy gives individual freedom to absorb knowledge (Nonaka, 1994). In other words, autonomy couldn't elicit without psychological empowerment. The psychologically empowered knowledge workers have the autonomy to share their knowledge and apply their knowledge in different situations in order to accomplish the work (Muhammed et al., 2013). In the knowledge creation process, psychological empowerment encourages the process of knowing and understanding through internal cognition process that drives external

behavioural processes related to knowledge creation and sharing (Muhammed et al., 2013). Thus the following hypotheses can be suggested:

H_1: Empowerment has a positive impact on knowledge creation process.

3.2.2 Capability Development and Knowledge Creation Process

In the knowledge management literature there is increasing evidence that the decision of knowledge acquisition and transfer inhabits within the capabilities provided by a firm's human capital (Freeze and Kulkarni, 2005). The organisational knowledge management capability has a direct influence on firm performance. For instance, empirical study carried out in 250 Fortune 1000 firms revealed that the firm's knowledge resources produce 'cross-unit synergies' and positively influence organisational performance (Tanriverdi, 2005). Therefore, knowledge can only be created if the capabilities determine the ability to do things (Leonard-Barton, 1995, Henderson and Cockburn, 1994). In spite of the recognised need for the creation and utilisation of knowledge assets, core emphasis has been given to the organisational capability development process in order to identify and quantify potential for effective knowledge creation, sharing and use of a firm's human capital (Freeze and Kulkarni, 2005). Until 1990, there were two streams that studied capability: one reiterates the knowledge mobilisation while other insists new knowledge creation for innovation (Kogut and Zander, 1992 and Prahalad and Hamel, 1990). However, recent knowledge management researchers affiliate the value of organisational capability to knowledge mobilisation and new knowledge creation for innovation. Thus, it is pertinent to suggest following hypotheses:

H_2: Organisational capability development has a positive impact on knowledge creation process.

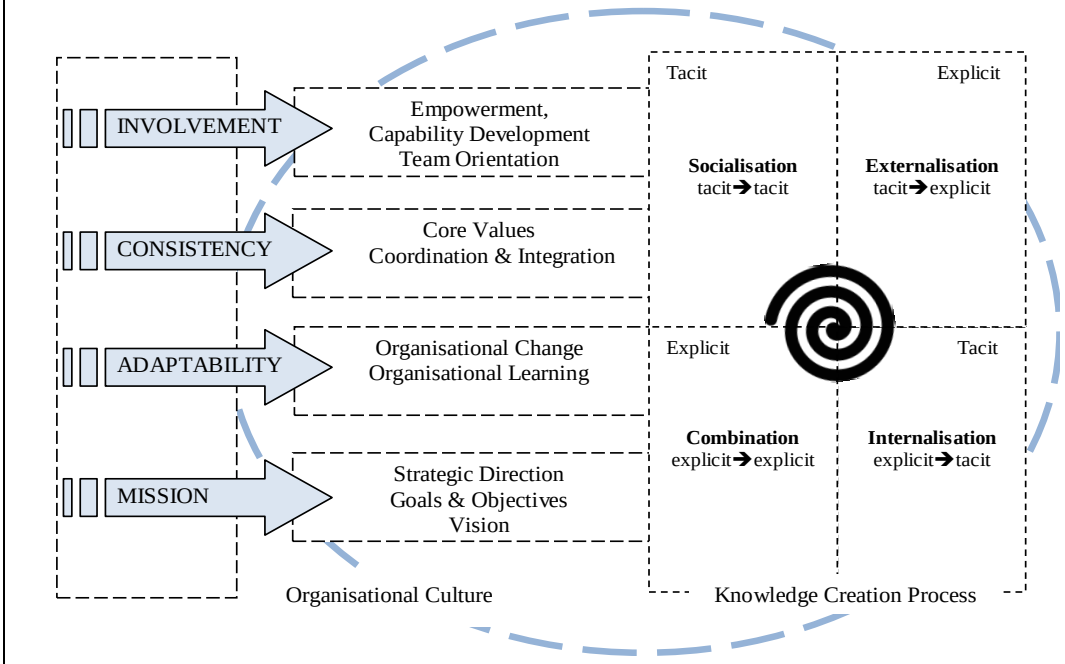
3.2.3 Team-Orientation and Knowledge Creation Process

It is argued "knowledge creation is typically an activity that is accomplished by a team of people rather than by individuals working alone" (Newell et al., 2009, p.23). Both cognitive and organisational theorists ascertain that team orientation in the

workplace is a pre-necessary condition for cognition process. There is also evidence suggesting that the team oriented culture typically do better than individuals especially when the job being done require more knowledge, skills, experience and judgement (Robbins and Langton, 2007). In other words, the process of combining information and knowledge into new knowledge and perceive the value of the exchange and combination require team oriented organisational culture in which people feel free in knowledge sharing and exchange (Collins and Smith, 2006 and Nahapiet and Ghoshal, 1998). Therefore, it assumed that, teamwork is unidimensional and there can be a link between teamwork and knowledge creation in the organisation (Collins and Smith, 2006 and Tushman and O'Reilly, 1997). Thus the following hypotheses can be drawn:

H_3: Team orientation has a positive impact on knowledge creation process

Figure 3.2: Conceptual Framework



3.2.4 Core Values and Knowledge Creation Process

The effective knowledge creation and diffusion cannot be undertaken until and unless high-performing organisations posit a clear set of core values that facilitate the management and employees make consistent decisions (Denison et al., 2004). It is acknowledged that the management decision of incorporating knowledge creation in

the core values provide a clear direction or 'perceived status' to members by taking knowledge creation as a core strategy of the organisation (Rooney and Schneider, 2005). Literature reveals direct positive link between a company's core values and workplace socialisation. For example, Von Krogh (2000a) indicated three elements in company's paradigm: goals, values and norms represent the contested impact on the employee access to key information and data which is mandatory in knowledge creation, sharing and exchange. Thus, it is pertinent to suggest following hypotheses:

H4: Organisational core values have a positive impact on knowledge creation process.

3.2.5 Coordination & Integration and Knowledge Creation Process

According to Gittell and Carmali (2009) relational coordination encourages psychological safety which is helpful in learning at the individual level. The process of coordinated knowledge creation converts an individual knowledge to the collective knowledge (Du Chatenier et al., 2009). It is argued that the exchange and combination of intellectual capital are coordinated and integrated activity in which professional knowledge workers use knowledge resources to produce joint output through the interaction of tacit and explicit knowledge (Seidler-de Alwis and Hartmann, 2008 and Nonaka et al., 2000). In other words, the dynamic interaction of explicit and tacit knowledge in knowledge conversion process heavily relies on the coordination and integration of knowledge workers (Du Chatenier et al., 2009). Thus the following hypotheses can be drawn:

H_5: Organisational coordination and integration has a positive impact on knowledge creation process.

3.2.6 Organisational Change and Knowledge Creation Process

In a changing scenario, the creation of new organisational knowledge has become an organisational priority for gaining sustained competitive advantage (Huysman and Dewitt, 2003; Nonaka and Teece, 2001 and Carneiro, 2000). It is widely acknowledged that the organisational transformation and all second-order change

initiative are highly dependent on its capability to create new knowledge (Schwandt, 1997 and Nonaka, 1994). In other words, organisational readiness to change (or organisational adaptability) is based on two factors: management transformational strategy (Easterby-Smith and Lyles, 2003) and ability to create and share knowledge effectively and efficiently (Abrams et al., 2003). Also, without considering the nature of knowledge sharing and exchange when firms enduring a transformational change initiative likely to increase problems. For example, knowledge management system without recuperating organisational social process (e.g. sharing and exchange) might not produce desired results as it supposes to be. Therefore, managerial focus has been shifted to understand the social dynamics (knowledge exploitation) than knowledge management system (knowledge exploration) for rather knowledge involved at the collective level for creating the organisational knowledge creation of new knowledge (Brenner and Tushman, 2003). However, scholars are yet indecisive regarding the potential relationship between organisational change and new knowledge. Thus, due to lack of evidence that unfolds the impact of organisational change in new knowledge creation, following hypothesis can be drawn:

H_6: Organisational change has a positive impact on knowledge creation process.

3.2.7 Organisational Learning and Knowledge Creation Process

Organisational learning is an important facet of knowledge-intensive organisation in order to strive hard and overcome confused and changing conditions (Hannah and Lester, 2009). In a knowledge creation process, learning facilitates knowledge acquisition without which new knowledge cannot be created (Alipour et al., 2011). It is argued that, employee's job effectiveness is strongly tied with ability to infer, diagnose and judge (Lipnack and Stamps, 2008). Because, in a learning organisation, people are 'proactive', 'reflective' and 'creative' in their learning and without developing cognitive skills, employee falls behind the required level of performance (Marsick and Watkins, 2003 and Marquardt, 2002). Therefore, it is argued that the new knowledge may be created much easier in learning organisations than non-learning organisations because they are not able to integrate new information with

existing information on a routine basis. Thus, it is safe to suggest following hypothesis:

H_7: Organisational learning has a positive impact on knowledge creation process.

3.2.8 Strategic Direction & Intent and Knowledge Creation Process

Knowledge strategy can be defined as the "set of guidelines and beliefs that shape an organisation's manipulation of knowledge" (Kasten, 2006, p.11). Kasten (2006) indicated a direct positive link between the organisation's strategic decisions and its knowledge structures and activities. A systematic knowledge management strategy is implemented to support the organisation's long-term business strategy (Salisbury, 2003). It suggested that the well aligned strategic direction conceptualises what knowledge to develop in the organisation (Bryson, 2010 and Nonaka, 2004). In particular, strategic direction should not be perceived merely as an object, but it should be shared one as top leadership has to ascertain its good fit with organisations' members to enhance the commitment and motivation toward attaining higher order goals (Bogler, 2001). Thus the following hypothesis can be drawn:

H_8: Organisational strategic direction & intent has a positive impact on knowledge creation process.

3.2.9 Organisational Goals and Knowledge Creation Process

Relevant literature also supports possible inter-correlation between organisational goals and knowledge creation performance. For example, Kao et al., (2011) reported that, both goal-driven (e.g. defined goal) and goal-free (e.g. directed thinking behaviour) likely to be favourable for knowledge creation. Mitchell et al., (2009) hypothesised that the goal cooperativeness between team members positively influences team knowledge creation. Thus, following hypothesis can be proposed:

H_9: Organisational goals have a positive impact on knowledge creation process.

3.2.10 Organisational Vision and Knowledge Creation Process

According to Nonaka (2004) within a company, there are five enablers for knowledge creation: vision, strategy, goals and objectives, structure, and system. In other words, developing a knowledge strategy for any organisation typically initiate with the re-configuring the organisation's vision and mission and the associated strategic direction and goals and objectives (Salisbury, 2003). Nonaka (2004) noted that, a knowledge vision is a working premise for knowledge. The organisational knowledge vision is now considered as a primary antecedent of creating a knowledge organisation (Al-Ali, 2003). A paradigm shift at the strategic level (e.g. organisational vision and philosophy) may be necessary for the harnessing relationship between vision, leadership conduct, and the individuals' workplace efficacy, work climate and organisation (Barrett and O'Connell, 2001). Therefore, vision and visionary leadership to establish a sense of motivation that invigorates employee satisfaction, on the one hand, (Kantabutra, 2009) and corroborate the impact of on the creation of new ideas on the other (Zaccaro and Banks, 2001). Since, knowledge workers share organisation vision as 'schema' (Kotter, 1982) or regard this as a 'course of action' of what needs to be achieved (Baum and Rowley, 2002). Therefore, knowledge vision (or 'vision assimilation') is turned into an integral part of the strategic choice of the firms that determine the purpose of existence and gives a direction to the process of knowledge creation (Bratianu, 2010 and Bogler, 2001). Thus the following hypothesis can also be suggested:

> ***H_{10}: Organisational vision has a positive impact on knowledge creation process.***

3.3 Summary

This research identifies the critical areas in knowledge creation research and evaluates the relevancy (degree of fit) of these areas in different organisational culture domains. Hence, ten hypotheses have been drawn from the literature. Chapter three briefly explain the theoretical framework comprised of independent variables (empowerment, team orientation, capability development, core values, coordination & integration, organisational learning, organisational change, strategic direction &

intent, goals & objectives, and vision) and four modes of knowledge creation (socialisation, externalisation, combination, and internalisation).

CHAPTER 4
RESEARCH METHODS

4.1 Introduction

The selection of the research method is not subject to the merits and demerits of that method. Likewise, there is no such yardstick that could corroborate the suitability of any of the research methods under predisposed circumstances. It has been confirmed from the literature that the research design may be determined by the nature of the research problem and the way through which it seeks answers (Crotty, 1998). According to Kaplan and Duchon (1988), no single research methodology is inherently superior to any other methodology. For example, in the late 1980s and early 1990s, social science researchers utilised elements of both the positivist and post-positivist approaches in a single study in order to improve the value of research. Therefore, their choice of mixed-methods research was not due to the merits and demerits of different substitutes, but the nature of the research problem.

In a management studies, mixed-methods as a methodology have been generally accepted (Bryman, 2005). Specifically, it was literally widespread in human resource management and knowledge management research literature (Modell, 2010; Cassell et al., 2006). However, the researcher preferred the mixed-methods due to observed gaps in the literature and the complex nature of the research problem. Also, the balanced philosophical stance plus the potential challenges during data collection also contemplated during the process of methodology selection. The design of this study decided to be convergent parallel (see Section 4.9) in which researcher used a concurrent timing to implement the quantitative and qualitative strands during the same phase of the research process, and keeps the strands independent during analysis and then mixes the results during the overall interpretation in such a way that they depict the apparent picture of the underlying phenomenon same as when standing alone (Creswell, 2013).

In the previous chapter, the literature review was briefly outlined. This chapter explains the selected methodological framework and process of the research design

utilised for this study based on the research aim and objectives. In particular, an attempt has been made to rationalise why a mixed methodology was selected for this empirical study, what were the potential advantages and the associated weaknesses of this choice. It describes and explains the research design and research method that will be employed to investigate the area of knowledge creation and the impact of organisational culture on it. It starts from the philosophical stance of research with the choice of the survey process in relation to methods and approaches. Second, the rationale and employability of research methods and research approach are illustrated. Third, the quantitative and qualitative sampling procedure and mixed-methods research design is summarised in the last section. The next section summarises the mixed-methods research question that has been formulated in order to explore the specific issues related to the aim and objectives (see Section 1.5) of this study.

4.2 Mixed-Methods Research Question

Notable researchers, e.g. Bryman, (2007); Creswell and Plano Clark, (2007); Tashakkori and Creswell, (2007); Tashakkori and Teddlie, (1998), generally acknowledged the importance of research questions in mixed-methods research. However, the literature has revealed no legitimate source that can prescribe how to write a mixed-methods research question because it is somewhat complex to outline a research question in a mixed-methods study than any particular method study. According to Onwuegbuzie and Leech (2006), mixed-methods research questions are questions that entrench both qualitative and quantitative research questions within the individual question. It requires both qualitative data and quantitative data to be collected and analysed either sequentially, concurrently, or iteratively. Specifically, mixed-methods research questions can be stated by one of three ways (Tashakkori and Creswell, 2013). The first way is to write qualitative and quantitative questions separately followed by an open mixed-methods question. The second way is to write a combined research question which is shortly divided into separate qualitative and quantitative sub-questions. Likewise, the third way is to write research questions for each phase as the study progresses.

In this study, the researcher keeps the two strands independent and the both quantitative and qualitative strands execute distinctively. The quantitative data collected through electronic and paper based survey while semi-structured interviews conducted for the qualitative data. Therefore, the mixed-methods question was written in such a way that the main research question contains the consolidated objective of the study. However, the main research question was further divided into two sub questions in such a way that the both sub questions (i.e. qualitative and quantitative) addresses underlying objectives of that strand or method. The mixed-methods research question is outlined as follows:

Mixed RQ: How does organisational culture affect knowledge creation process?

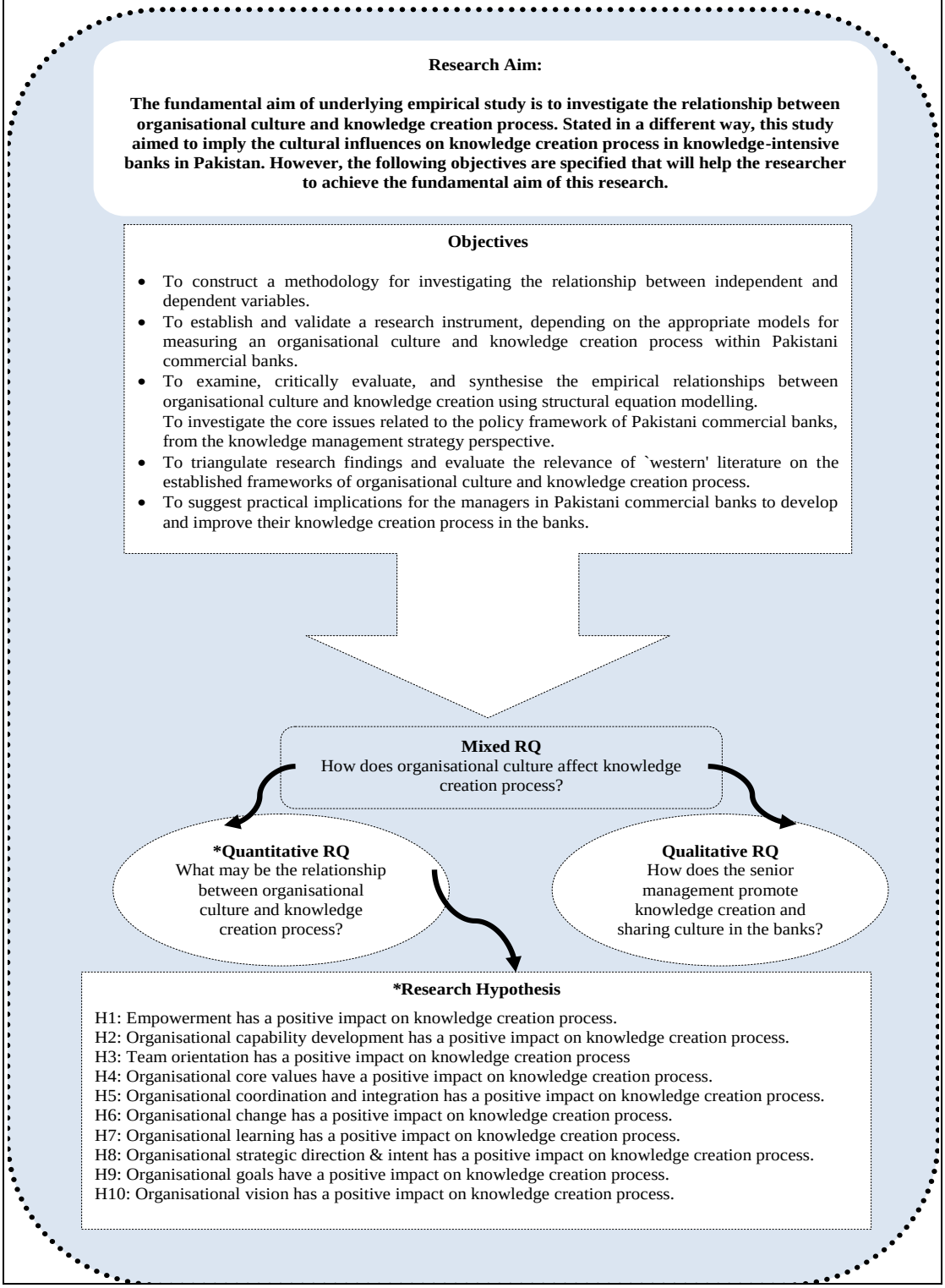
Afterwards, the mixed research question was divided into separate qualitative and quantitative sub-questions that are answered in each strand of the study. The quantitative sub-question is outlined as follows:

RQ1: What may be the relationship between organisational culture and knowledge creation process?

The first sub-question is answered quantitatively during hypothesis testing (or path analysis) through the model fit using structural equation modelling (SEM). The quantitative strand intends to investigate the structural relationship between organisational culture and the knowledge creation process. For this, data is collected from the employees of three commercial banks in Karachi. In contrast, the qualitative question was outlined in order to unfold the core issues related to the policy framework of Pakistani commercial banks from knowledge culture and knowledge management implementation and use (see Objective 4). The qualitative sub-question is outlined as follows:

RQ2: How does the senior management promote knowledge creation and sharing culture in Pakistani banks?

Figure 4.1: Relationship between Research Aim, Objectives, Research Question, Research Sub-Questions and Research Hypotheses



Precisely, the senior leadership is the core partaker in formulating policies and setting organisational goals and objectives. They are also accountable to provide

sustainable organisational culture that may be conducive in creating and managing new employee knowledge. Hence, qualitative data from the purposely selected participants is expected to provide a more comprehensive picture of the underlying problem than previous studies. In the qualitative strand, senior leadership and HR heads of three leading commercial banks in Karachi who were involved in policymaking were targeted for interviews. Specifically, qualitative information is valuable for investigating social, organisational or cultural upbringing of underlying phenomenon and unfolding people to accept wisdom towards any issue or problem (Corbin and Strauss, 2008). Thus, the purpose of qualitative information was to probe quantitative results in more depth and to seek opinions and perceptions of the target population because interviewing is one of the important tools of data collection familiar with participant perception, belief and behaviour (Guthrie, 2010; Creswell, 2013).

Generally speaking, quantitative and qualitative sub-questions are required to be answered either quantitatively or qualitatively. Therefore, mixed-methods allow researchers to acquire data about situations, behavioural patterns, norms or practices at one point of time. The quantitative component allows researchers to examine more variables about the real world phenomenon that is typically not possible with other approaches. For this, a questionnaire survey would be appropriate for quantitative analysis in order to draw inferences from this data regarding existing relationships. In contrast, the qualitative component is primarily concerned with answering 'why' and 'how' questions within the context. For this, the interview survey intends to examine the behavioural pattern and specific phenomena in more detail. However, the dialogue between quantitative and qualitative components is initiated at the opening of the research design. For example, Bryman (2007, p.21) wrote that “a valid mixed methods research is much like a dialogue or debate, and the idea is then to construct a negotiated account of what they mean together.” In this study, the quantitative data used to examine the hypothesised relationships between organisational culture and knowledge creation process whereas; qualitative data from the purposely selected participants used to provide a more comprehensive picture of the underlying problem.

4.3 Epistemological Position and Research Methodology

Generally, in research, a choice of research designs may be dependent on two aspects (Denzin and Lincoln, 2011). First is the research aim and objectives; whereas, the second is the researcher's philosophical understanding, experience, and personal beliefs or assumption. Although, this is not as simplistic as it appears. For example, deciding research methods is not just a matter of random choice from the available set of different methods such as interview, questionnaire, focus group and observation. Also, it is not a choice of convenience based on quantitative and qualitative approaches. Hughes and Jones quoted that:

> ...the philosophical level of the research method relates to its assumptions based on the most general features of the world, encompassing such aspects as the mind, matter, reality, reason, truth, nature of knowledge, and proofs for knowledge. (Hughes and Jones, 2003, p.87)

Research philosophy and research approach involve different research paradigms and issues of ontology and epistemology. In other words, while undertaking a piece of research, it is always imperative to maintain symmetry between research philosophy and research approach. Thus, after deciding ontological and epistemological assumptions and taking an objective-subjective versus positive-phenomenological position of the research, an important decision related to methodology needs to be taken. In other words, an understanding of philosophical issues is noteworthy due to numerous reasons. For example, different paradigms lead to studying underlying phenomena in different ways. It not only describes a number of organisational phenomena from different perspectives, but also highlights different kinds of knowledge that derive throughout observing the same phenomena from different philosophical perspectives (Hatch, 2012).

The choice of research methodology is always susceptible to the philosophical assumptions of the researcher because philosophical perspective not only explains the nature of society, but it also unveils the nature of science through which new knowledge can be produced (Burrell and Morgan, 1979). The nature of science

concerned with either a subjective or an objective approach to research, and these two philosophical approaches are explicated by several core assumptions of the researcher regarding ontology (i.e. reality), epistemology (i.e. knowledge), human nature (i.e. pre-determined or not), and methodology (Holden and Lynch, 2004).

More specifically, the researcher's philosophical assumptions about ontology, epistemology and human nature play an important role in the selection of research methodology (Gill and Johnson, 2002). Collis and Hussey (2003) specified a research methodology as a comprehensive strategy to the research process, from the theoretical assumptions to the data collection and data analysis. However, philosophical assumptions about ontology, epistemology and human nature are consequential to each other. Holden and Lynch states that:

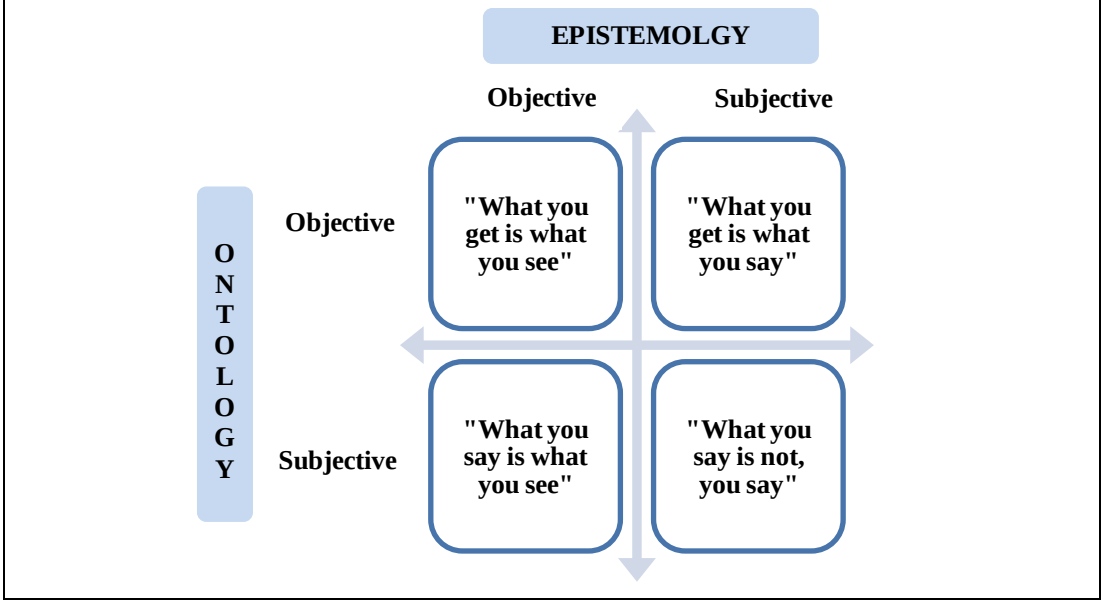
> ...their view of ontology effects their epistemological persuasion which, in turn, affects their view of human nature, consequently, choice of methodology logically follows the assumptions the researcher has already made. (Holden and Lynch, 2004, p.3)

Ontological assumptions may either be extremely objective or extremely subjective. An objectivist asserts that social reality is independent of social actors. According to Morgan and Smircich (1980), it is an objective phenomenon that provides accurate observation and measurement. The narrative of objectivism potentially relies on the external world (or reality). Since, it is based on the notion that the external reality is a product of human activity which only works as a responding mechanism even though the perceptions and beliefs may persuade this process to some extent (Morgan and Smircich, 1980). In contrast, subjectivists negate the objectivist view. For example, Morgan and Smircich (1980, p.494) state that "the reality is masked by those human processes which judge and deduce the phenomenon in consciousness prior to a full understanding of the structure of meaning it expresses."

In other words, social reality is a protrusion of human imagination. For example, human nature is different from animals or physical objects, and it immediately

narrates the gist of underlying phenomenon, situation or event. The ability to obtrude something shaped the world within a specified frame of reference in terms of different experiences and perceptions (Morgan and Smircich, 1980; Gill and Johnson, 2002). Figure 4.2 shows these two extremes in an objective-subjective continuum. According to Morgan and Smircich (1980), at one extreme of the continuum, an objectivist approach supports an epistemological standpoint of positivism; whereas at the other extreme of the continuum, the subjectivist approach favours phenomenological epistemology.

Figure 4.2: Objective-Subjective Continuum



On the other hand, epistemology is a branch of philosophy that is concerned with the study of knowledge (Collis and Hussey, 2009). Epistemology claims about 'what can be known', 'what exists may be known' and 'how and what it is possible to know' (Chia, 2003 and Blaikie, 2007). The adequacy and nature of knowledge requires that there is a specific way which informs us how to seek answers to the research question which is assumed to be true and show the reality. The way we see truth and reality reflects an epistemological position. For example, an epistemological position can be described as objectivists and constructivists; objectivists hold the truth that is objective, and it is out there irrespective of our awareness about it; whereas constructivists hold that there is not an objective truth, it is to be constructed by people with their interaction with this world (Crotty, 1998). According to the Maynard (1994, p.10) "epistemology is concerned with providing a philosophical

grounding for deciding what kind of knowledge is possible and how can we ensure that they are both adequate and legitimate."

Table 4.1: Research Assumption, Question, Method and Approach		
Ontological Assumption Culture and its impact on knowledge creation and the application of the SECI model will enrich the insights of an organisation into their knowledge creation and the processes involved in it (Haag et al., 2010).		
Epistemological Assumption Epistemologically can be assumed that different organisation culture values or attributes may have an impact on the employees' knowledge creation process.		
Research Question How does organisational culture affect knowledge creation capability?		
Research Paradigm/Methods i) Positivism (Quantitative)	ii) Post-Positivism (Qualitative)	iii) Pragmatism (Mixed)
Research Approach i) Ethnographic iv) Case Study	ii) Action Research v) Survey	iii) Experiment

In addition, epistemology is also described in relation to ontology (Bhattacherjee, 2012). The term ontology as a philosophical perspective in social sciences claims about 'what is reality', 'what exists', 'what units make it up', and 'what it looks like' (Creswell, 2013). Laughlin (1995) posits that human behaviour is also part of ontology. Thus, the role of the researcher in finding that reality is related to human behaviour assumptions. Therefore, it is not meaningless to say that, ontology is an assumption about the reality with respect to people, society and the world (Eriksson and Kovalainen, 2008).

In contrast, an epistemology provides answers to the questions: 'what is the relationship between the researcher and that researched'? (Creswell 2013). In other words, knowledge that is produced from epistemology is propositional knowledge. The propositional knowledge is a valid knowledge which can be articulated in a declarative sentence and which contends to explain a factor state of affair. However, a proposition may either be true or false. Therefore, Eriksson and Kovalainen (2008) asserts that, it doesn't actually express a fact, but it defines how knowledge can be produced and argued. However, similar to the two ontological assumptions, i.e. objective ontology and subjective ontology, researchers also portray two epistemological positions typically known as positive epistemology and

phenomenological epistemology (Morgan and Smircich, 1980; Collis and Hussey, 2009; Bryman, 2004).

For any research, ontological and epistemological assumptions make up a paradigm (Mack, 2010). The ontological assumption makes the researcher's mind for epistemological assumptions, which further make a choice of research methodology. In the case of this study, the ontological position is based on the assumption that culture may be a factor in knowledge creation through the application of the SECI knowledge creation model (Haag et al., 2010). However, the researcher assumed this standpoint at the epistemological level and that the different organisational culture values may have an impact on knowledge creation process. In effect, the mutual input of all these steps gives rise to data collection.

Literally, the researcher holds that the social actors play an accompanying role in attaining and interpreting language, slogans, codes and labels in order to understand and recognise reality (Morgan and Smircich, 1980). The role of human beings in gaining knowledge is obligatory as we cannot separate the knower and the known out from the discourse of social reality (Morgan and Smircich, 1980). In a similar vein, knowledge subsists in the reality of the world where human beings identify the nature of relationships among social phenomena (Johnson and Onwuegbuzie, 2004). Therefore, in spite of following any one of the philosophical standpoints within objectivism-subjectivism continuum, the researcher holds a middle position in his ontological and epistemological assumption. Hence, it is neither solely positivist (objective) nor interpretivist (subjective). For that reason, the researcher is required to follow any mixed methodological position that not only deals with the objective social world, but it also provides some subjective implications so that we can infer and interrelate with the social world. For instance, an important relationship between organisational culture and the knowledge creation process intends to establish on the basis of both the objective knowledge that can be gathered and measured empirically through the quantitative method and the subjective meaning of social action through a different logic of a research procedure. The researcher intended to take a balanced philosophical standpoint as it not only substantiates the reality and significance of the

natural or physical world but it also acknowledges the importance of the social and psychological world.

The complex nature of the research problem in this study also requires intense investigation. For this purpose, the researcher collected data from two different sources. The bank managers and employees provided information to investigate the causal relationship between organisational culture and knowledge creation. Thus, information about policy consideration on knowledge management initiatives were obtained from senior managers and HR heads of the banks. For that reason, the researcher is required to follow any mixed methodological position that not only deals with the objective social world, but it also provides the researcher with some subjective implications so that the researcher can infer and interrelate with the social world. However, while evaluating different methodological approaches, the researcher tends to choose both quantitative (positivism) and qualitative (post-positivism) paradigm in a single study.

Positivism is the tenant of a positive epistemology. According to Morgan and Smircich (1980), the positivist supports the view that the researchers do not hold the knowledge, but they can only observe and measure knowledge. Positivism is a philosophical approach of a scientific inquiry that presumes objective knowledge gathered from experience, direct observation and can be measured empirically through quantitative methods (e.g. surveys and experiments) (Easterby-Smith et al., 2008; Eriksson and Kovalainen, 2008: Hatch, 2012). The positivism (also called scientific paradigm) usually accepts data based on scientific evidence and breaks down this data to isolate elements (Guthrie, 2010). Additionally, strict rules and procedures in positivism may be useful to yield quantifiable data that will lead to either accept or reject the hypothesis (Robson, 2002). In other words, positivists generate hypotheses from theory that can further be tested (numerically) that will thereby allow justifications of laws to be assessed (Bryman, 2004).

In contrast, phenomenological (or normative, interpretive) epistemology is based on the subjective ontological assumption as predecessors of subjective ontological and

phenomenology epistemological assumptions usually adopt the qualitative methodological approach (Collis and Hussey, 2003; Bryman, 2004). Specifically, it differentiates the social science and natural science in terms of subjective norms and procedures. According to Morgan and Smircich (1980), phenomenologist emphasise the process through which human beings corroborate their subjective experience and consciousness. Unlike positivism, phenomenology provides the subjective meaning of social action through a different logic of the research procedure (Bryman, 2004).

Methodologically, the objective ontological and positive epistemological assumptions typically pursue a quantitative methodological approach. A quantitative approach tends to emphasise quantifications in the data collection and data analysis. It aims to employ deductive approach to look intently at the relationship between theory and research. It also facilitates theory testing and developing hypotheses. However, a quantitative approach requires large samples and data that are highly specific and precise because results from a representative sample can be generalised to the population (Collis and Hussey, 2009). Furthermore, quantitative researchers use a positivist claim for developing knowledge through theory testing by employing strategies of inquiry such as experiments or surveys. For this purpose, quantitative data can be collected by predetermined instruments (Creswell, 2013).

On the other hand, the purpose of a qualitative research is to generate theories by employing an inductive approach and a qualitative design is generally associated with the post-positivist philosophical level (Bryman, 2004). Post-positivism is one of the most common philosophical approaches that consider knowledge as a subjective phenomenon (Guthrie, 2010). Post-positivists assert that human knowledge is based on human hypothesis. Therefore, human knowledge is entirely hypothetical; whereas**,** confirmation of hypotheses is acceptable through subjective interpretation than by theory testing using quantitative models (Bryman, 2004; Guthrie, 2010). Moreover, as a model of scientific enquiry, post-positivism depicts a meta-theoretical stance that critiques and amends positivism. Therefore, critical realists endeavour to resolve criticisms about positivism. It also recognises that all observations are imperfect, and all theories may be reversible because the researcher can get closer to

the truth through theories, but it may not obtain the real truth (Collis and Hussey, 2009).

It has long been debated that the methodology used in physical sciences might not fit in social sciences due to a number of reasons (Onwuegbuzie, 2002). For instance, the qualitative and quantitative methodologies stand on different philosophical assumptions thereby contradictory and incompatible (Smith and Heshusius, 1986). The concept of using both qualitative and quantitative methods in a single study derived from Campbell and Fiske (1959, p.81) who wrote that "in order to measure the relative contributions of trait and method variance, multiple traits, as well as multiple methods, must be utilised in the validation process." In this connection, the concept of methodological triangulation (or mixing of two datasets) is most common as it facilitates the validation of data through cross-verification of data sets from more than two sources (e.g. interviews, observations, questionnaires and documents) (Johnson and Onwuegbuzie, 2004; Bogdan and Biklen, 2006; Denzin and Giardina, 2006; Onwuegbuzie and Leech, 2007). Therefore, the aim of this mixed-methods study is to integrate quantitative and qualitative data sets for measuring the underlying research phenomenon in a single investigation thereby integrating quantitative and qualitative methods in different ways (Johnson and Onwuegbuzie, 2004; Onwuegbuzie and Leech, 2007; Creswell, 2009).

4.4 Mixed-Methods Validity

In the previous segment, mixed-methods as a research methodology have been discussed. In the following segment, the researcher hereby intends to justify why the mixed-method as a research methodology is appropriate for this study. As indicated, research methodology is subject to philosophical assumptions of the researcher. According to Gill and Johnson (2002), the choice of research methodology can be selected on the basis of the nature and content of the research phenomenon and the degree of the available resources. In this study, the mixed-method has been opted on the basis of following three yardsticks.

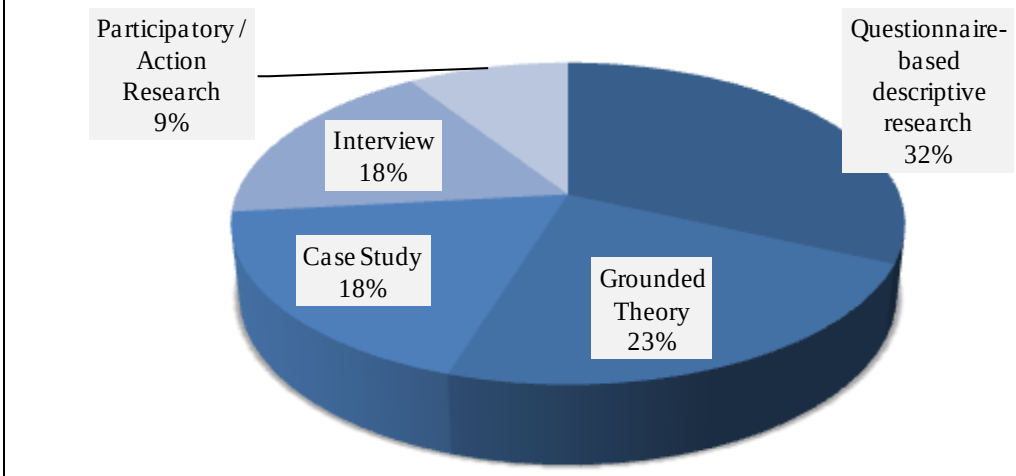
i) A research method that provided the basis for evaluating the philosophical underpinning (as elucidated in the previous section) of the research question.

ii) A research method that has been widely used in the relevant research.

iii) A research method that showed relevancy to research questions.

Although, a massive amount of empirical research has been conducted on the knowledge management research agenda, there is "no identifiable research methodology" that can serve the purpose (Wallace et al., 2010, p.5). For example, a 60% of the knowledge management researchers employed research methodologies and were typically derived from the social sciences research (Wallace et al., 2010). Due to no identifiable research methods and overdependence on the research methods used in the social sciences, the researcher decided to use the research method on the basis of three yardsticks. First, a research method that better served the purpose. Second, a research method widely used in management sciences research. Third, a research method widely used in knowledge management research. For example, research methods that have been widely used in management studies can be categorised into three transitions; i.e. earlier, later and most recent (Karami et al., 2006).

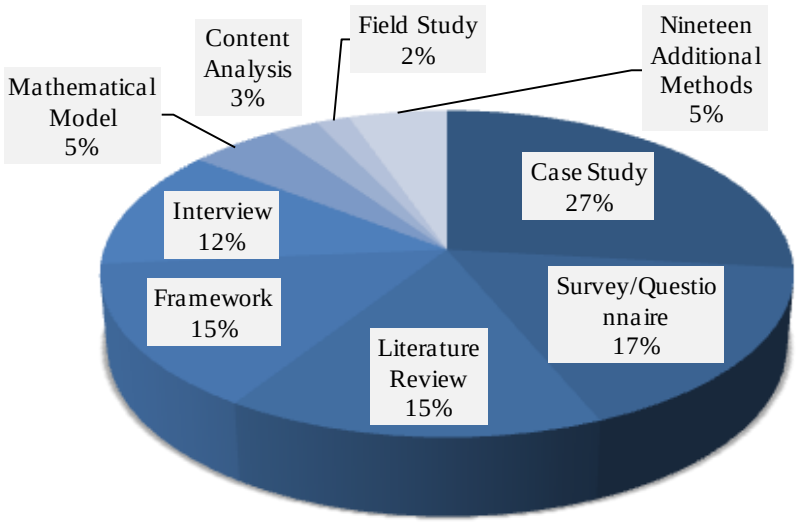
Figure 4.3: Research Methods Used in Management Research - Karami et al., (2006)



Karami et al. (2006) reported that the research methods used in management studies were typically based on positivism as a philosophical approach of a scientific enquiry with an early emphasis on case studies; a later emphasis on empirical methods; and a more recent emphasis on the qualitative and phenomenological methods. As shown in Figure 4.3, out of 217 articles published in the leading management journals, a

total of 32% (69) were questionnaire-based descriptive research, 23% (50) used the grounded theory approach, 18% (40) employed the case study method, 18% (38) conducted interviews and 09% (20) were based on action research.

Figure 4.4: Research Methods in Knowledge Management Research – Wallace et al., (2010)

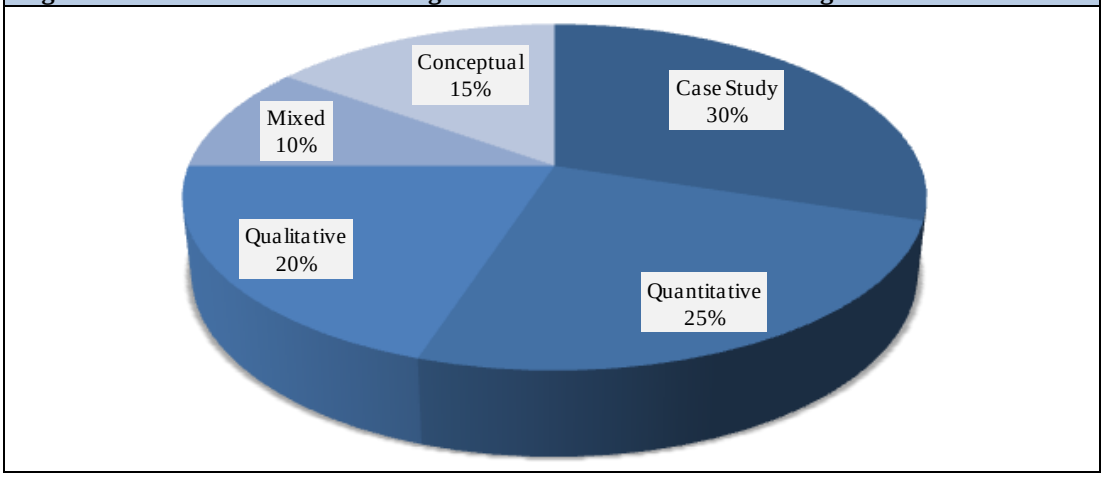


In the case of knowledge management research, out of 630 articles published during 2006 and 2008 in the most recognised knowledge management journals, 28% (175) used no identifiable research methodology while 72% (455) used provisionally identifiable research methods. As shown in the breakdown of the provisionally identifiable research methods, 26.8% were qualitative case studies, 16.9% used questionnaire survey, 11.9% based on interviews, 1.8% consists of field studies and 5.3% of the articles used miscellaneous social science research methods (Wallace et al., 2010).

However, the researcher believes that no research paradigm is better than another as each is suited to its particular purpose. In the case of research methods used in organisational culture and knowledge creation research, the researcher browsed through the relevant knowledge management journals and extracted twenty relevant publications. All publications selected were based on the assumption that the principal author should have utilised Nonaka's SECI knowledge conversion model for measuring knowledge creation in different domains of organisational culture. It revealed that out of 20 articles, 30% were case studies, 25% were quantitative, 20% were qualitative, 10% were mixed-methods and 15% were conceptual papers.

The suitability of the research method was also evaluated through the relevancy between the research question and the research method. As mentioned before, the purpose of this study is to investigate the relationship between organisational culture and knowledge creation in Pakistani banking organisations. As shown, the underlying purpose can only be accomplished by conceptualising, measuring and analysing data about both the empirical relationship between organisational culture and knowledge creation (quantitative → objectivist → positivist) and the employees' knowledge management implementation and use (qualitative → subjectivist → post-positivist) paradigms. The multifaceted nature of the research problem and involvement of many dependent and independent variables require integration of quantitative and qualitative dataset into a single investigation to address the underlying problem in more detail. Hence, the research question of this study may better be addressed through a mixed (qualitative + quantitative) research method.

Figure 4.5: Research Methods in Organisational Culture and Knowledge Creation Research



However, it is, nevertheless, likely that during empirical investigation, researchers might not abolish the likely influence of people, place and structure of the knowledge creation process. Likewise, the researcher might not get rid of the likely influence of top level management and HR managers of commercial banks during the knowledge creation process that may sabotage the entire mechanism through their decisions and policy recommendations. Also, this study proposed to carry out in uncontrolled and context specific environment of the banking organisation. In such a situation, the study requires a qualitative research method or post-positivism as a system of philosophy in order to address 'what' and 'how' questions and unfold the exploratory

nature of the underlying problem (Yin, 2003). For that purpose, a qualitative portion (i.e. knowledge management implementation and use) needs to measure qualitatively by interviewing from top level management and HR managers of commercial banks in order to tap their perceptions about the policy framework of knowledge management in banks.

The researcher believes that a quantitative study might not be suitable for exploring the research phenomenon because there is a lack of established models that can explicitly measure the relationship between organisational culture and knowledge creation. Therefore, a qualitative study was utilised to recognise the relationships among organisational culture and knowledge creation process to build more concrete models for a quantitative analysis. In the light of the above justification, a mixed-methods research has been utilised as the best method that combines quantitative and qualitative methods to investigate organisational culture and knowledge creation in this study. More to the point, a mixed-methods research seems to be more suitable to explore the aims and objectives of this study and to answer the research question than individual methods. As, Nonaka quoted that:

> ...knowledge creation refers to the continuous process through which one overcomes individual limitations and restrictions imposed by prevailing information and past experience by attaining a new perspective, a new observation of the environment and new knowledge. (Nonaka, 1994, p.33)

Therefore, it can be hypothesised that the knowledge creation process is influenced by organisational culture which can be measured with a set of values such as empowerment, trust, team orientation, learning and development, strategic direction, etc. By considering the view of objectivism, knowledge supposes a reality that can be objective and observed. It can be measured numerically and characterised physically and involves culture, cultural values, human behaviours, and subjective thoughts. Nonetheless, positivism barely deals with a social phenomenon and it does not regard knowledge as subjective reality thus it is not suitable for this study. In contrast, subjective interpretation is helpful in comprehending and unfolding complex social

phenomena, but makes measuring knowledge creation unattainable. Though, measuring knowledge creation is undeniably a core objective of this study. For that reason, it is better to pursue the middle position of objectivism-subjectivism to investigate the underlying relationship. As knowledge creation refers to the term of a continuous process rather than a static or object, the middle position has the potential to fit together the insights provided by quantitative and qualitative research into a workable solution that involves induction for 'discovery of pattern' deduction for 'testing of theories and hypotheses' and abduction for 'uncovering facts through a set of explanations for understanding results' (de Waal, 2001; Johnson and Onwuegbuzie, 2004).

The main question of this study is: how does organisational culture affect knowledge creation process? Paradoxically, organisational culture has received a narrow empirical and analytical coverage in the study of organisational knowledge creation. Therefore, the significance of the proposed quantitative-driven mixed-methods empirical study is to develop an integrative framework of organisational culture attributes in knowledge creation capability (De Long and Fahey, 2000; Rai, 2011). However, a quantitative study is the only way through which a researcher can determine the strength of the hypothesised relationships among the constructs (Harrington, 2008). For this, structural equation modelling (SEM) is utilised to measure the validity of a theoretical structure through testing the structural relationship between endogenous and exogenous variables (Burnette and Williams, 2005; Kline, 2011). In contrast, the core issues related to the policy framework of Pakistani commercial banks from an organisational culture, and the knowledge management implementation strategy perspective was investigated through semi-structured interviews with senior management. Apart from the theoretical and methodological justifications, the researcher also pursued recent literature. For example, Jogulu and Pansiri noted that:

> ...different findings created through multiple data collection and analysis techniques provide insightfulness and extensiveness in overall results, from

> which researchers can make more accurate inferences with increased credibility. (Jogulu and Pansiri, 2011, p.688)

Consequently, a mixed-methods research is seemingly prudent to accomplish the research objective and to answer the research question. As has been discussed, the researcher holds a middle position in terms of ontological and epistemological assumption that guides to select the positivist and neo-empiricist approaches to this study. However, it is now prudent that the researcher decides the methodological consideration on the basis of both positivist and neo-empiricist approaches. In this connection, the subsequent section summarises how mixed-methods research is employed in this study.

4.5 Mixed-Methods Research

Motivated by the 'middle-range' philosophical assumptions in terms of ontology, epistemology and methodology (Laughlin, 1995), the researcher has adopted a mixed-methods research in the present study to examine the research problem. For mixed-method research, Johnson et al. wrote that:

> …the type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches (e.g. use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the broad purposes of breadth and depth of understanding and corroboration. (Johnson et al., 2007, p.113)

It is argued that no single research methodology is inherently superior to any other methodology (Kaplan and Duchon, 1988). In the late 1980s and early 1990s, social science researchers utilised elements of both the positivist and post-positivist approaches in a single study in order to improve the value of research (Kaplan and Duchon, 1988; Galliers and Sutherland, 1991). However, their choice of mixed-methods research was not due to the merits and demerits of different substitutes, but the nature of the research problem.

In spite of the conflict between paradigms that restrict researchers to adopt mixed-methods research in a social science enquiry until 1980s, the mixed-method research has become the third paradigm in social science research as an innate complement to traditional qualitative and quantitative research (Johnson and Onwuegbuzie, 2004). In the management studies where positivism has long dominated, mixed-methods research is now widely accepted in a wide variety of disciplines such as human resources, marketing, organisational behaviour, strategic management, knowledge management and human psychology (Grafton et al., 2011; Jogulu and Pansiri, 2011). Therefore, the pristine use of inductive and deductive logic in a single study can improve the results so that researchers can make inferences with more confidence. The inductive and deductive logic of enquiry permits researchers to uniformly embark on theory generation and hypothesis testing without conciliating one for the other. Likewise, identical divisions between two methods with the help of multiple data sources and analysis firmly create contrary views and findings. For that purpose, the researcher has employed mixed-methods for plunging over-dependence on quantitative data to define the subjective nature of the social phenomena and experiences.

In a more abstract sense, the mixed-methods approach addresses several critical issues concern with theoretical and methodological practices. It impacts upon the study's aims and outcomes as it provides a reasonable agreement between theories with methodology. It also ensures the reliability and validity of the overall research findings. In addition, the conservative ascendancy of any one particular research technique, either qualitative or quantitative dichotomies, creates research outcomes of high standing (Jogulu and Pansiri, 2011). In general, validity and reliability have primarily resulted from quantitative research. However, a qualitative study offers significant aspects in the course of the subjective interpretations of experiences that provide conceivable answers in relation to social phenomena and individual experiences (Pansiri, 2005; Jogulu and Pansiri, 2011).

In terms of philosophical underpinning, the conflicting and contradictory views of both positivist philosophies (quantitative design) and post-positivist philosophies (qualitative design) frequently utilised in conjunction is normally known as a

triangulation of methods (Jogulu and Pansiri, 2011). Therefore, mixed-methods research usually employs pragmatism or a pragmatic approach as a system of philosophy (Johnson and Onwuegbuzie, 2004). For instance, in mixed-methods, researchers normally pertain to build knowledge on pragmatic grounds (Creswell, 2013; Maxcy, 2003). It offers a workable solution either philosophically or methodologically when the main theory exists on a quantitative and qualitative research paradigm. Furthermore, pragmatism as a system of philosophy extends the result of an oriented technique of enquiry with the required logic of justification thus providing a suitable methodological fit amid different (or mixed) paradigms (Johnson and Onwuegbuzie, 2004). Pragmatism, as a philosophical approach, views knowledge as an indispensable reality or an intimate experience (Johnson and Onwuegbuzie, 2004). Pragmatists believe that existing truth, implication, and the boundaries of knowledge are impermanent thus knowledge can be changed, modified or altered with or without research over time (Johnson and Onwuegbuzie, 2004).

4.6 Quantitative Data

The banking sector in Pakistan has witnessed severe changes over a period of 65 years. Primarily, it suffered from the delicate shortage of resources and insecurity due to unstable political and socioeconomic conditions. The present Pakistani banking sector is relatively more knowledge-intensive than other sectors as it contains heterogeneous and pervasive knowledge capital. In last one decade, the advent of globalisation brought noteworthy changes in the work related values amongst employees of public and private sector organisations of Pakistan reflecting a modern market economy (Khilji, 2004). Although, the changing competitive fringe of the asset management has affected the main business sectors, the post-globalisation knowledge influx considerably changed the work-related values at both individual and organisational level (Akhtar, 2001). The privatisation of the state owned banks helped to improve the I.T. platform and human resource of these banks. The implementation of an effective knowledge management system further helped to increase the required capability to transfer contents, services and solutions in the form of knowledge services and that it encourages and sustains the new knowledge creation, sharing and use as an indispensable element of banking success.

At present, there are currently 28 domestic banks, 06 foreign commercial banks and 04 specialised banks operating in Pakistan. Approximately, 117,856 people employed in the overall banking sector and it offers financial services to around 26.6 million people across the country (SBP Quarterly, 2010). In terms of microeconomic and macroeconomic contribution, the Pakistani banking sector contributes major share in the GDP by increasing local and foreign investments, offering strong capital inflows, supporting socio-economic stability, and thereby improving per capita income and job creation.

Methodologically, the research questions and hypotheses presented based on the gaps that identified in the literature such as the application of the SECI model in the banks and its relation to organisational culture, especially in the Pakistani context. The research method (see Section 4.4) justifies a mixed approach (quantitative and qualitative) to explore the relationship between organisational culture and knowledge creation process. This study considered the financial services sector of Pakistan. For the purpose of the survey, these methods applied to the research site of knowledge-intensive banks in Karachi. However, little research has been done so far to investigate the use of SECI processes in the banks. Therefore, the respondents for both self-administered and electronic survey selected based on the justification of the role of knowledge-workers in relation to the SECI model in the banks. For this, the researcher initially confirmed the sample population in terms of the role of the knowledge-worker in relation to the SECI model.

In the KM literature, a knowledge worker (by definition) is difficult to characterise due to the abstractness of the concept (Smith et al., 2005). Mostly, the researchers have characterised a knowledge worker according to the aim and objectives of their study (Pears, 1972). For example, Drucker (1998, p.12) first coined that “knowledge worker is one who works primarily with information or one who develops and uses knowledge in the workplace.” Nomikos (1989) described knowledge workers as a group of people that includes professors, engineers, physicians, accountants and scientists. Toffler quoted that “knowledge workers in the era of the knowledge economy must have some system at their disposal to create a process and enhance

their own knowledge" (Toffler, 1990, p.27). Likewise, "knowledge workers are the agents of change" (Nonaka, 1994, p.71) and "knowledge workers are workers whose main capital is knowledge" (Davenport, 2005, p.119). Reinhardt et al. (2011, p.45) mentioned that the job of the knowledge worker is a problem solving and it requires a combination of convergent, divergent, and creative thinking. The role of knowledge workers varies from organisation to organisation and industry to industry. For example, knowledge workers are employees who have a deep background in education and experience such as teachers, nurses, doctors, lawyers, bankers, architects, and financial analysts (Cooper, 2006, p.89).

Like other organisations, employees working in the banks perform the same role as a knowledge worker. In case of Pakistani banks, the role of knowledge workers in banks in relation to the SECI model further unfolds that, employees working in human resources, IT and systems, learning and development, marketing, and brand management departments are directly involved in knowledge creation, sharing and use. For example, employees working in human resources appraise the organisational performance based on raw information (Moore and Rugullies, 2005; Geisler, 2007). IT and systems allow people to create personal or job-related connections with people involved in the same kind of work; that is to create, share and disseminate information (Nonaka and Takeushi, 1996; Davenport and Prusak, 2000; Geisler, 2007). The knowledge workers involved in the learning and development use new and existing information to improve personal knowledge, skills and abilities. Likewise, people in marketing and brand management disseminate information in the public (Davenport and Prusak, 2000; Brown et al., 2003; Geisler, 2007; Nonaka and Konno, 2005).

In terms of HR activities, Kase et al. (2009) suggested the mechanism through which HR practices facilitate knowledge creation process using the SECI model. It argues that HR activities encouraging interaction among employees result in knowledge sharing and creation. Through different HR functions, e.g. recruitment and selection, work design, reward and recognition, training and development, and career growth firms can encourage knowledge transfer among its employees (Rehman, 2013). As

argued by Kase et al. (2009), the work design in terms of job specification, contents, and methods supports workplace socialisation activities in the organisation. In other words, the role of HR manager is very much crucial during allocating 'spatial proximity' and building structural relationship between workers. In this process, the aim of a work design is to remove barriers from intra-organisational knowledge transfer by locating the workers from the different department in the same project. In the combination phase of knowledge creation process, people can exchange and combine knowledge in a tangible or intangible forms, and collect new information by making the connection of new and old knowledge work towards new concepts and organising ambiguous concepts into the structure. The knowledge-intensive organisations tend to capitalise internal resources for knowledge creation through the combination process (Rehman, 2013). For this, the different HR activities i.e. recruitment and selection used to involve untrained workers to work in a team on the project in a regular way for capitalising multiple knowledge sources developed for the purpose (Kase et al., 2009).

The different HR practices in the organisation also support knowledge externalisation in which non-codified tacit knowledge transfers into codified explicit knowledge. As noted earlier, the knowledge externalisation is a process of converting subjective, intangible, and inexpressible knowledge into objective, tangible, and expressible knowledge in the form of documents, manuals, procedures, and methods. For example, Kase et al., (2009) argues that an effective HR practices in terms of work design such as, collaborative incentives can facilitate the process of knowledge codification. Therefore, the effectiveness of the last sequential stage in knowledge conversion cycle in which explicit knowledge converted into tacit knowledge could be heavily dependent on the effective learning avenues and continuous process of learning provided by the HR department in the organisation (Kase et al., 2009).

In case of financial and banking sector, the role of I.T and other support functions in the banks in terms of the role of knowledge workers in relation to the SECI model is also very crucial. Therefore, the use of the SECI model enhanced the insights of organisation into their knowledge creation and the process involved in it. For

example, from socialisation perspective of knowledge creation, literature pointed out that the role of knowledge intensive banks in creating and managing knowledge enhance customer loyalty and trust (Mizintseva and Gerbina, 2009). The I.T infrastructure, I.T support functions in the banks, however, responsible to meet the knowledge needs through capturing and sharing explicit knowledge of an organisation by providing shared common access to information (Becerra-Fernandez et al., 2004). The process of knowledge externalisation in the banks helps bankers to solve risk management issues by developing knowledge repositories that may be helpful in codifying the new information, clarifying the risk assessment procedure, and simplifying the process manuals (Ribiere and Chou, 2001).

In the combination phase, people can exchange and combine knowledge in tangible or intangible forms and collect new information by making the connection of new and old knowledge, work towards new concepts, and organising ambiguous concepts into the structure. The role of I.T staff is to meet the knowledge needs through capturing and sharing explicit knowledge of an organisation by providing shared common access to information (Becerra-Fernandez et al., 2004). Thus, the combination process in the banks is responsible for knowledge exploitation by providing a free access to corporate information and transferring and diffusion of the valuable information stored in databases and repositories (Shih and Lin, 2010). The knowledge internalisation (or learning by doing) in the banks help members to learn required skills for accomplishing routine tasks and facilitates compare and contrast customer requests, complaints by determining the customer's needs and interests with personal experience (Calabrese and Remshard, 2006). However, the globalisation of the financial sector is compelling bankers to become more efficient in managing, preserving and leveraging existing knowledge resources in order to remain competitive. Thus, the role of I.T and other support functions in the banks in terms of the role of knowledge workers in relation to the internalisation process strengthens the learner's confidence and the skill deemed complementary in a routine banking job (Haag et al., 2010).

In conclusion, the SECI model, theorised by Nonaka and Takeuchi (1995) best embraces the nature of KM and of knowledge creation process. In the case of banks, the relevant literature, however, support the role of a knowledge worker in relation to the SECI model. Therefore, this particular study endeavored to provide a clearer understanding of the aspects of each process of SECI in banks. For this, the respondents for both paper electronic surveys selected in terms of the role of knowledge workers in relation to the SECI model. Thus, each unit of the population selected independently and the selection of each respondent was not dependent on the selection of another employee. In the subsequent section, the process of quantitative data survey is briefly summarised.

4.6.1 Quantitative Survey

The process of quantitative data survey initiated with the formal letter of request to the HR heads of the participant banks. For this purpose, a formal letter along with a letter from the Director of Studies (see Appendix C) to conduct a questionnaire survey and interviews e-mailed to HR heads (see Appendix D) on June 05, 2012. As a result of a formal request, HR heads of three commercial banks realised the importance of the research and permitted to coordinate and facilitate for this study. The success of quantitative survey depends upon the research sample (Maylor and Blackmon, 2005, p.195). However, a sample must be representative of the larger population from which a precise result can be inferred (Ghauri and Gronhaug, 2010, p.138). After getting permission for questionnaire survey and interviews from 03 commercial banks, an e-mail contact list of employees obtained from the HR department of each bank that would be used as a sampling frame for a paper-based and electronic questionnaire survey. These contact lists used to categorise the sample population with respect to employee job ranks and job functions based on the justification of the role of knowledge-workers in relation to the SECI model (see Section 4.6) in the banks. For example, jobs were categorised according to the four job ranks (i.e. executive/junior officer, manager/assistant manager, senior/deputy manager, and administrative/non-management staff) and twelve job functions (i.e. retail banking, consumer banking, corporate and investment banking, Islamic banking, risk management, financial control, global operations, human resources, IT

and systems, learning and development, marketing and brand management, and legal and corporate affairs). Although that the researcher's previous research experience in the same domain somehow mitigated the potential constraints in the survey process, it may be worth mentioning to note that the banking operations in Pakistan are scattered across the country and it is not possible for researchers to cover the entire banking sector within the 03 years of PhD study. Therefore, the researcher decided to conduct survey in 03 commercial banks located in Karachi.

The sample was randomly drawn from the 50 branches of three knowledge-intensive commercial banks in Karachi. For this purpose, the employee contact lists received from the human resource managers of each bank used as a sampling frame from which a sample was drawn. The quantitative data was collected by one of two ways. Firstly, the researcher sent (see Appendix E) the HTML-generated link to 200 respondents at their email addresses with a formal request to complete the online survey. Secondly, a paper-based self-administered survey was randomly distributed among 235 respondents in their offices during field work in Karachi.

Figure 4.6: Online and Paper Survey Response Rate

A total of 435 questionnaires were randomly distributed in a both (i.e. electronic and paper) version of the surveys. The online survey was initiated in September 2012 while the data during field work collected in five months from November 2012 to March 2013. A total of 71 respondents completed the online survey. The seven of online submitted surveys were invalid due to unfinished answers. Hence, the

response rate of online survey remained 32% (i.e. 64/200×100 = 32%). In contrast, out of 235 surveys distributed during field work, only 74 respondents returned the hard copies of their completed surveys. The five of these were rejected due to incomplete answers and 69 were valid thus the response rate remained 29.3% (i.e. 69/235×100 = 29.3%). In both versions of surveys, a total of 435 questionnaires were randomly distributed to the three commercial banks in Karachi. A total of 145 (i.e. 71+74 = 145) questionnaires were returned. The total response rate remained 33.3% (i.e. 145/435×100 = 33.3%). However, a total of 133 or 30.5% (i.e. 133/435×100 = 30.5%) valid and completed surveys used for the quantitative data analysis. Figure 4.6 shows a summary of the electronic and paper-based survey response rate.

In addition, the both versions of the questionnaire (i.e. electronic and paper) were identical in terms of the questions, wording, and order of presentation of the survey. In order to avoid any duplication of responses during randomly drawn sample in the both electronic and paper surveys, a simple random sample (SRS) technique was employed to choose a subset of individuals (e.g. sample) from an employee contact list received from the human resource managers of each bank. Each employee was chosen randomly and totally by chance. For example, in total, seven hundred twenty employees (N = 226+213+281 = 720) working in the 50 branches of the three commercial banks, namely B1 (n = 226), B2 (n = 213) and B3 (n = 281) located in Karachi participated in the survey. In a both (i.e. electronic and paper) version of the surveys, a total of 435 employees chosen randomly by selecting every 5^{th} employee from the contact list so that each individual has the same probability of being chosen.

In quantitative studies, the sample size usually depends on three factors: i) the population size; ii) the variability in the instrument; iii) the size of the effect to be measure. May (2011, p. 101) wrote that "it is worth nothing that a large population may not necessarily require a larger sample size and the greater variability in the variable, or what is being measured, the larger the required sample size in cases of research where only small effects are expected in the population, such as exploratory medical research, a larger research may be required". In order to maximise a sample size and minimise a lack of response, the researcher used multi-mode survey

approach. A combination of electronic and self-administered questionnaires obtained 30.5% valid responses. The response rate to electronic survey was initially low before two successive follow-up emails. As a percentage of sample, the researcher obtained only 9% (i.e. 18/200×100 = 9%) response rate after first email. However, the percentage of response rate considerably increased up to 17% and 32% after two successive reminders. In a self-administered survey completed study comparing differing methods of administration, response rates close to 60% were achieved by multi-mode contacts. This mixed-mode approach, combining both mailed and e-mailed survey instruments with an Internet-based response mechanism, also is an approach to help reduce the problem of coverage error in administration of surveys.

Data collection is a critical process in any research and could require different expertise and resource to obtain the sufficient data and response rate (Zikmund, 1991). In spite of utilising multi-mode survey approach, the response rate was below expectations. In some cases, a respondent usually agrees to participate but may refuse to answer some questions. In case of this study, a total of 2.7% (i.e. 12/435×100 = 2.7%) respondents submitted unfinished surveys. The possible reason behind lack of response rate of questionnaire survey could be manifold. For example, the first and the most important reason of lack of response was limited time and financial resources usually required in the process of data collection. Another reason for the non response from banking employees to complete the survey may be the lack of self-interest and research culture in the Pakistani organisations in general and banking organisations in particular.

In terms of the organisational level, the sample size came from four levels of each bank (i.e. branch office, regional office, circle office and head office) with the largest numbers coming from the branch offices which accounted 51.3%, regional offices which covered 32.9% and the rest of the sample 15.8% sample coming from circle offices. In addition, the researcher also provided the basic information on the research problem, research aim and objectives, research procedure, the implication of the findings, possible risks, and benefits associated with the study. Information was

given that the participation in the survey was voluntary, and the participant could withdraw at any time.

Also, the researcher assured the participants of the compliance of all ethical standards deemed mandatory for data collection. For this, the participants are guaranteed anonymity and confidentiality. No personal data is asked for or retained. If completing online: cookies, personal data stored by the web browser were not used in this survey. In this connection, electronically submitted responses were securely deposited into the researcher's e-mail Inbox within an off-site computer system without involving any third party in the subsequent process as this type of survey does not allow researchers to identify potential respondents because electronic (virtual) responses will automatically be recorded and transferred directly to the password protected e-mail Inbox. Likewise, confidentiality of the responses was also ensured in other modes of survey (e.g. self-administered and survey through the HR heads). In terms of ethical issues, no problems were observed during data collection.

4.6.2 Pros and Cons of Paper vs. Electronic Questionnaire Design

In recent years, the use of electronic questionnaire design for conducting an online survey has been increased with the advent of information technology (Salmon et al., 2004). There are many merits and demerits of the online survey as compared to other survey methods such as on-the-spot and postal survey (Nulty, 2008). Fink (2012) cited that online survey which is designed and completed online covers a large geographical area at negligible distribution cost. This survey method is also good for validation purpose because it allows only required answers. In addition, researchers can easily track user response rate and send automatic reminders to respondents. The electronic survey also proffers some other specific advantages for anyone who needs to conduct a survey. For example, the ease of use, confidentiality, and ability to lessen the strenuous job of data entry and analysis are some noteworthy pros of this method (Dommeyer et al., 2002 and Watt et al., 2002). Apart from notable merits, the researchers should consider the shortcomings and demerits of the electronic questionnaire. For example, participants must be self-motivated to return the completed survey (Nulty, 2008). Therefore, the inadequacy of the response rates is

also a particular problem in this method (Dommeyer et al., 2002). Most importantly, the selected respondents must be connected with internet and able to use a browser (Fink, 2012).

However, the paper and pencil survey is a traditional survey method usually ideal for respondents who are not computer literate or do not have an access to the internet. In addition, the use of paper and pencil survey produces useful information with high response rate. In comparison to online survey, the respondent can answer questions most conveniently through a paper survey even on sensitive topics (Fink, 2012). In contrast, the researchers must be keeping in mind the potential demerits usually dominated during paper and pencil or self-administered surveys. For example, this survey usually requires self-motivated respondents to return the survey and presence of the researcher during the administration. In some situations, respondents may return an incomplete survey that leads to produce a low response rate thus diminishes the value of the results.

4.7 Qualitative Data

The qualitative data can be collected with an array of methods including documents, archival records, interviews and observations (Yin, 2003). In the case of this study, the researcher conducted semi-structured interviews as the main approach to collect the qualitative data. However, the qualitative data was used along with quantitative data for triangulation results in order to better understand the problem (Arksey and Knight, 1999). The use of interviews seeks to emphasise the rich, real-world context in which the phenomena occur (Eisenhardt and Graebner, 2007, p.9). Therefore, in order to accomplish the research objective and to address the qualitative strand of the mixed-method question (see Section 4.3), the researcher followed the footprints of previous researchers in the related area for employing semi-structured interviews for qualitative data collection in the banks (e.g. O'Regan et al., 2001; Stovel and Bontis, 2002).

Besides this, the selection of an appropriate person for an interview is one of the important and complex issues in qualitative research. Rubin and Rubin (2011) argued that the participants should be selected on the basis of his/her knowledge and

experience within the area in which interview is to be undertaken. The experienced and knowledgeable interviewees not only ensure convincing results, but they also provide useful information about the research problem. For this, researchers followed the instructions of other studies involving the same issue (e.g. Bontis and Fitz-Enz, 2002; Bontis et al., 2002; Crossan and Hulland, 2002; Stovel and Bontis, 2002; Roberts and Amit, 2003; Curado, 2008). Hence, the researcher purposely selected the participants for their interview. This qualitative sampling method permitted the researcher to decide which members of the population are most likely to provide the answers to the research questions (Pansiri, 2005). Therefore, the researcher approached senior managers at the organisational level within a single industry (Hitt et al., 2001; Rouse and Daellenbach, 2002; Curado, 2008). Following the instructions of researchers in the related area, several criteria were used in selecting the participants to be included in the study.

- The interviews were conducted at the senior management level respondents in order to reduce motivation and information bias associated with different hierarchical and functional levels (Lakshman, 200 and Doty et al., 1993).

- The information collected during interviews supported a qualitative image of the organisation in terms of how knowledge is managed in the Pakistani commercial banks (Curado, 2008).

- The interview must address broad organisational concerns regarding knowledge management and transfer at strategic domain issues (Szulanski, 2002 and Curado, 2008).

Arguably, senior management cadre is directly involved in the formulation of the business strategy and policy as they possess substantial knowledge regarding different aspects of the organisational culture in which knowledge creation and sharing is performed. Also, senior management usually involved in the decision making on strategic matters of the organisation. In this connection, they might have a better ability to understand the research problem than lower level management and

employees. For that reason, only senior managers and HR heads purposely considered for interviews in the qualitative phase of this study. Indeed, it seems that there has been difficulty for the researcher to arrange interviews especially in the financial sector as these organisations are often reluctant to share information. Getting access to senior bank managers was to be one of the most challenging tasks, because people in the top hierarchy usually have very busy schedules or rare free time (Lakshman, 2009). Moreover, in developing countries, it is generally perceived that the researchers have to deal with enormous difficulties in getting access to targeted participants for conducting interviews if they have not any reference or contact with any related personnel. In the case of this study, the researcher's three years past experience as a financial and research analyst in the financial sector of Pakistan and previous research experience during a partial completion of a Master's degree in Pakistani banking organisations undoubtedly lessened the potential hindrances that one might encounter during the data collection process.

In the course of that, the first step was to identify the names of senior managers and HR heads who were involved in the banking organisation's human resource policy formulation process with banking industry experience. During the browsing of the websites of commercial banks, the researcher identified four human resource's heads, three senior vice-presidents and three regional operation managers as potential respondents for face to face interviews. In the second step, the researcher formally contacted the HR heads to apply for access and scheduling interviews. Hence, the initial contact started in November 2012 by sending e-mails to the respective banks stating a formal request of participation including a letter from the Director of Studies in an attached file (see Appendix C). In this e-mail request, the researcher provided all necessary information deemed indispensable to obtain consent from respondents. For example, it included the complete explanation of the research, its aim and objectives, possible implications of the findings and an option to refuse or to participate in the research. It also explained the main interview questions, the potential benefits associated with this research, and a guarantee of confidentiality.

As a result of continuous efforts and two consecutive reminders, three senior managers and three HR heads showed an agreement for the participation in the interview process. Nevertheless, the main reason behind the refusal from the rest of the management personnel was the lack of interest in the topic or a busy schedule. However, interviews were scheduled after ensuring the participation of each interviewee. The researcher sent a list of interview questions to each participant one week before the interview so they can prepare in advance. A total of six interviews were conducted in four months from December 2012 to March 2013. The first interview with a senior HR manager was arranged and conducted on the 6th of December 2012; two more interviews were also conducted during the month of December 2012. On total, six interviews were arranged and conducted in three months from January to March.

4.7.1 Qualitative Survey

As noted, a total of six interviews were conducted with senior managers and HR heads. All the interviews were carried out face to face in the location of the respective organisations. The average duration of the single interview was 37.6 minutes. Two interviewees offered permission to audio record the interview; notes of four non-recorded interviews were taken on paper. It helped researcher to capture the main points promptly and to formulate follow-up questions. The overall process of conducting interviews was comprised of four steps: i) preparation; ii) introduction; iii) asking questions; and iv) conclusion. Following the suggestions of Easterby-Smith et al. (2008), the researcher initiated the interview with introductory questions. It recommended that prior knowledge about the interviewees and their circumstances is important to conduct a successful interview. It might be significant for creating a pleasant environment and building trust between both parties (Easterby-Smith et al., 2008). At the opening of each interview, the researcher briefed the interviewees with the scope of the study, the aim and objectives of this research, and the possible implications of the findings. It was also clarified that the researcher seeks the interviewee's own judgment and understanding, and there might be no right or wrong answer for each question (Rubin and Rubin, 2011).

In order to explore more profound and comprehensive information, the researcher reviewed each interview process. For example, after reviewing the first interview with the senior HR head, the researcher found that the interviewee was completely discerned about the knowledge creation mechanism; he was not aware how knowledge can effectively be created from people's interaction. In the review process, the researcher came to know that the introduction at the beginning of each interview was helpful for better understanding of the research problem. In addition, the researcher asked two types of questions during the interviews: a) main questions; and b) follow-up questions. All of these questions were purposely designed so that interviewees talked freely about their judgment, experience and understanding (Rubin and Rubin, 2011). Initially, eleven questions under five categories were finalised and asked in the first two interviews.

Table 4.2: Interviewees Profile

Code	Interview Exposure	Interviewee Designation	Interview Type	Schedule
NBPHR1	Commercial Bank 1 Karachi	Executive Vice-President (H.R.M and Admin. Group)	Face to Face	6. 12.12 12:00-1.00
NBPRH2	Commercial Bank 1 Karachi	Regional Head	Face to Face	21.12.12 10:00-11:00
HBLDGM3	Commercial Bank 2 Karachi	Deputy General Manager (Content Management)	Face to Face	21.01.13 1:00-2:00
MCBHR4	Commercial Bank 3 Karachi	HR Head	Face to Face	06.02.13 2:00-3:00
HBLHR5	Commercial Bank 2 Karachi	Senior HR (Central)	Face to Face	18.02.13 11:00-12:00
MSBSVP6	Commercial Bank 3 Karachi	Senior Vice-President	Face to Face	26.02.13 1:00-2:00

However, after performing a preliminary analysis of the data of these two interviews, the researcher added four follow-up questions. Corbin and Strauss (2008) indicated that the follow-up questions can only be prepared after some preliminary analysis. For example, after conducting two interviews, the researcher realised that the interviewees appeared to be less vocal on the knowledge management policy issues and more vocal on the learning and development in the organisation. Therefore, in

the rest of the interviews, the researcher added other follow-up questions in order to explore the related issues in more detail. In a similar vein, two more follow-up questions were added to the category of knowledge accessibility and flow. It was found that the initial response on knowledge accessibility was unclear and required detailed information. Therefore, it was asked how organisations were creating an effective new knowledge from people's interaction. All of the interviews were conducted in the Urdu and English languages. For analysis, they were translated, transcribed and coded into English. In order to retain flexibility, all interviewees were informed that they can leave the interview at any time. Almost, all of the interviewees had already decided to allocate 45 to 50 minutes for this process. Subsequently, the maximum and minimum time spent on the interviews was 55 and 35 minutes respectively. However, the researcher asked interviewees to share any missing points or unasked information before closing the interview. Finally, the researcher closed the interview with a positive salutation. As a result of all this procedure, the researcher obtained a large amount of valuable information from each case. However, in spite of taking pre-emptive measures, some of the potential limitations were encountered. In the next section, mixed-method research design is explained. However, the pilot study utilised in a formal way and initial draft of qualitative interview guide refined through a systematic use of pilots. The subsequent section summarised a researcher reflection on the pilot study and key lessons learned which informed development of the final study.

4.8 Pilot Testing – Process and Reflection

The use of pilot testing is manifold in the social science research. For instance, pilot testing (also termed as pre-testing) is often useful before final data collection using a particular research instrument (Baker, 1994). In other words, the use of pilot testing is valuable in a small scale feasibility studies normally carried out in preparation for the major study (Polit et al., 2001). Most importantly, the purpose of conducting a pilot study is to check instrument validity, clarity, and remove ambiguity so that the maximum response rate can be obtained (Saunders et al., 2011).

In this mixed-methods study, the pilot study utilised in a formal way and initial draft of both quantitative and qualitative questionnaires refined through systematic use of pilots. For example, in the case of quantitative study, the quantitative data derived from 29 completed surveys utilised to measure the reliability of the scale using an internal consistency method and validity of the scale using face and content validity method. The findings of the both reliability and validity analysis in a pilot study help researcher in order to increase instrument clarity and remove ambiguity. However, in the case of qualitative study, the findings derived from the content analysis of 07 semi-structured interviews taken from senior management of the 03 banks. The finding of the first semi-structured interview used for the piloting purpose so that the initial draft of the interview questionnaire can be refined through identifying potential researcher biases using a familiarised procedure for testing the quality of an interview protocol (Chenail, 2011). In spite of its recognition, the qualitative interviewing upholds severe threat for researchers in terms of instrument trustworthiness and response bias. Poggenpoel and Myburgh (2003, p. 320) wrote that, "if time is not spent on preparation of the field, reflections of the researcher, the researcher staying humble and preferring to work in teams so that triangulation and peer evaluation can take place." The first semi-structured interview was conducted following to the same protocol of the main study (Chenail, 2011). The initial dress rehearsal permit researcher to identify difficult and vague questions. As a result, a total of three questions reworded in the knowledge strategy and cultural barrier categories. In addition, the data collected during pilot study was thoroughly analysed that may be used to address instrumentation bias and assess whether each question provide an adequate response.

4.9 Mixed-Method Research Design

A research design involves the complete procedure for collecting, analysing, interpreting, and reporting data in research studies (Creswell and Plano Clark, 2007). Yin (2003, p.6) defines research design as "logical illustration that relates the data to be collected and the conclusions to be drawn to the initial questions (or objectives) of a study." In case of mixed-method study, literature indicates a variety of design options depending upon the decision points such as; interaction, priority, timing, and

mixing (Creswell, 2013). For example, Tashakkori and Teddlie (1998) reported three types: i) equivalent status design; ii) dominant/less dominant design; iii) multilevel design. Creswell (2013) delineated [6]six basic designs of mixed-methods namely: i) convergent parallel design; ii) explanatory sequential design; iii) exploratory sequential design; iv) embedded design; v) transformative design; vi) multiphase design. However, before choosing a suitable mixed-method design in a mixed-methods study, the researcher needs to be consistent and clear in terms of four key decisions such as; i) the level of interaction between the strands; ii) the priority; iii) the timing of implementation; iv) the procedures for mixing (integration) the strands (Creswell, 2013).

Table 4.3: Key Decisions in Mixed-Methods

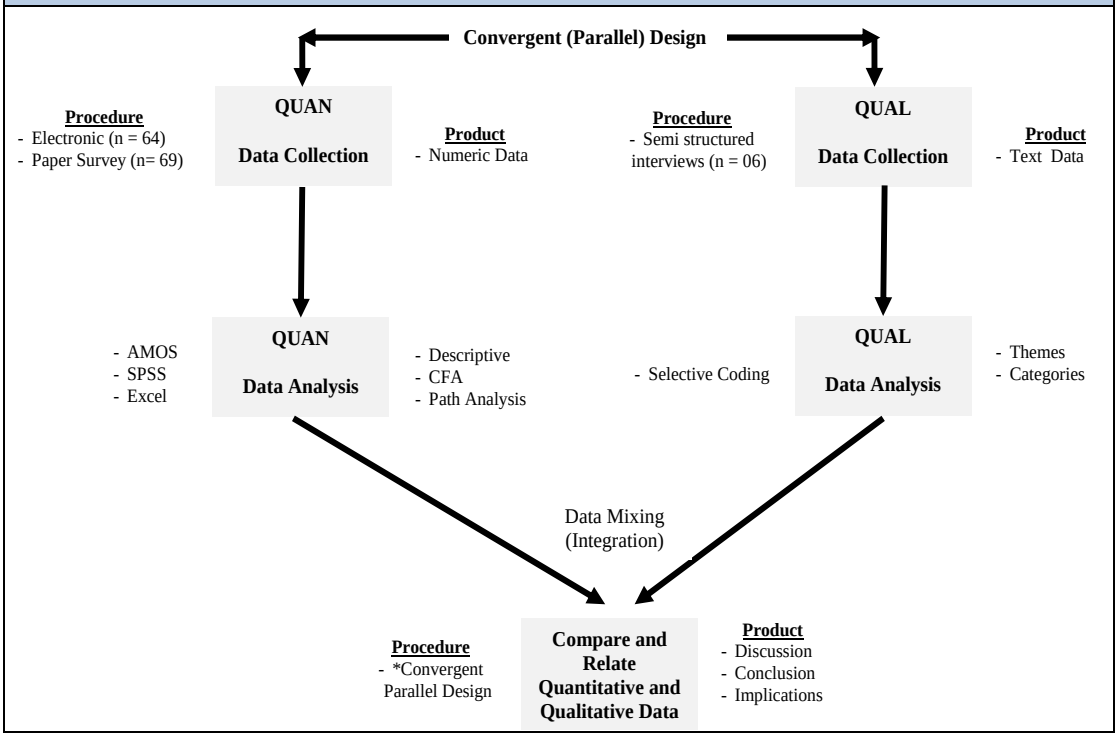
Level of Interaction	Priority	Timing	Mixing
Independent Interactive	Quantitative Qualitative Equal	Concurrent Sequential Multiphase Combination	During Interpretation During Data Analysis During Data Collection

The first important decision in mixed-methods study is to decide the level of interaction between the quantitative and qualitative strands. The level of interaction in a mixed-methods study may be either independent or interactive (Greene, 2007).

[6] **The convergent parallel design** occurs when the researcher uses concurrent timing to implement the quantitative and qualitative strands during the same phase of the research process, prioritises the methods equally, and keeps the strands independent during analysis and then mixes the results during the overall interpretation. **The explanatory sequential design** starts with the collection and analysis of quantitative data, which has the priority for addressing the study's questions. This first phase is followed by the subsequent collection and analysis of qualitative data. The second, qualitative phase of the study is designed so that it follows from the results of the first, quantitative phase. The researcher interprets how the qualitative results help to explain the initial quantitative results. **The exploratory sequential design** begins with and prioritises the collection and analysis of qualitative data in the first phase. Building from the exploratory results, the researcher conducts a second, quantitative phase to test or generalise the initial findings. The researcher then interprets how the quantitative results build on the initial qualitative results. **The embedded design** occurs when the researcher collects and analyses both quantitative and qualitative data within a traditional quantitative or qualitative design. In an embedded design, the researcher may add a qualitative strand within a quantitative design, such as an experiment, or add a quantitative strand supplemental strand is added to enhance the overall design in some way. **The transformative design** is a mixed methods design that the researcher shapes within a transformative theoretical framework. All other decisions (interaction, priority, timing, and mixing) are made within the context of the transformative framework. **The multiphase combines** both sequential and concurrent strands over a period of time that the researcher implements within a program of study addressing an overall program objective. This approach is often used in program evaluation where quantitative and qualitative approaches are used over time to support the development, adaptation, and evaluation of specific programs (Creswell, 2013 p. 71-72).

In case of an independent level of interaction, both quantitative and qualitative strands execute distinctively. For example, research questions, data collection, and data analysis of both strands may not be dependent on each other. However, the results of both strands can only be mixed while drawing conclusions at the end of the study. In contrast, the level of interaction in an interactive design permit direct interaction between the two strands (i.e. quantitative and qualitative) so that the two strands can be mixed before the final interpretation. Also, an interactive design allows researchers to mix the results from one type of strand into the other type of strand so that the different data sets can be analysed together (Creswell, 2013).

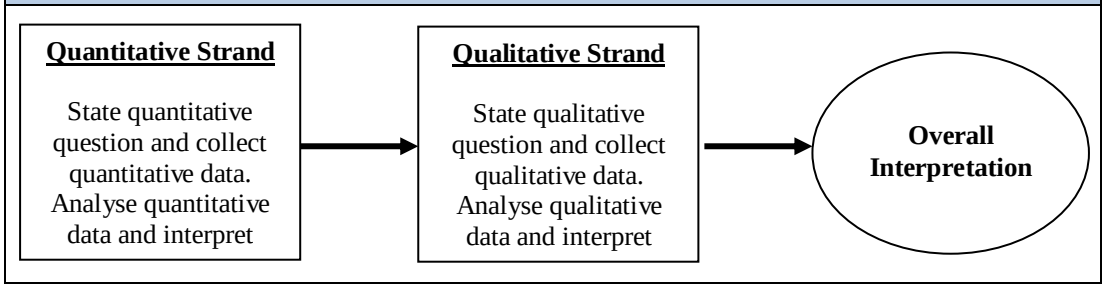
Figure 4.7: Mixed-Method Research Design – Creswell (2013)



In a mixed-methods design, priority refers to the relative importance or weighting of the quantitative and qualitative methods for answering the research questions (Creswell et al., 2003). The decision of fixing priority ((implicitly or explicitly) typically depends either upon the mixed-methods research questions or the researcher's prudence of solving the problem. In this regard, researcher's philosophical underpinning and research aims and objectives play a significant role in selecting data collection and analysis processes (Creswell and Plano Clark, 2007 and Creswell, 2013). In this study, priority is given to the quantitative method. The

decision of imparting priority was made on the basis of research aims and objectives, which is to investigate the relationship between organisational culture and knowledge creation process. The purpose of the quantitative strand was to categorise 'predictive power' of hypothesised relationship. However, qualitative method used to collect textual data through semi-structured interviews. Purpose of qualitative strand is to clarify why certain internal and external factors, tested in the quantitative survey, may be potential significant predictors of the employees' knowledge creation phenomenon in banking organisations.

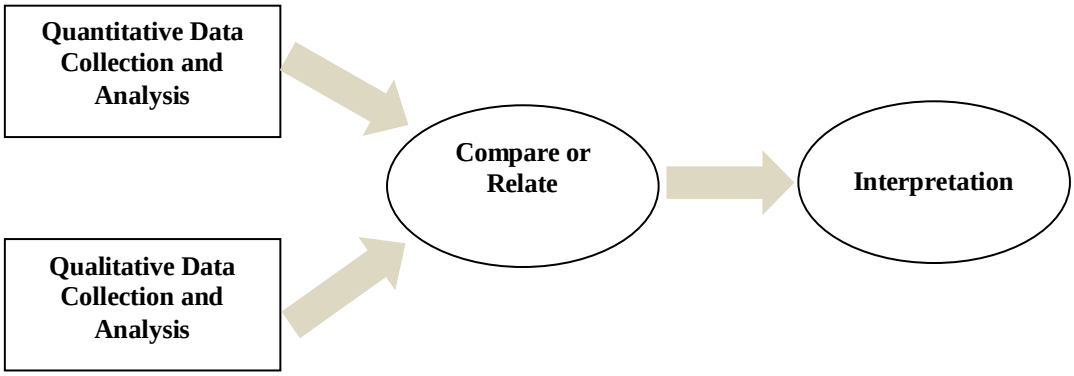
Figure 4.8: Data Strands in Mixed-Methods



The timing refers to the pacing and implementation decision in which quantitative and qualitative data to be collected and analysed (Creswell, 2013). Timing relates to the preference of the researcher in which he/she implement quantitative and qualitative studies either concurrently, sequentially or multiphase combination (Ivankova et al., 2006; Creswell, 2013). For example, concurrent (or parallel) design allows researchers to implement qualitative and quantitative strand during a single phase approximately at the same time. In contrast, sequential design or timing implement in two distinct phases in which data collection, and analysis of one strand implement after the data collection and analysis of other strand. However, multiphase combination timing is a combination of both concurrent and sequential elements within mixed-methods study. In case of this study, the researcher has opted concurrent mixed-method design due to several theoretical and practical concerns. For example, concurrent (or parallel) design allows researchers to collect both quantitative data and qualitative data about the topic of interest in a shorter period that equally support the research questions during data analysis (Creswell, 2013).

The last important decision relates to data mixing (or integration) of both qualitative and quantitative strands. According to the Morse and Niehaus (2009), the quantitative and qualitative strands are mixed at the stage of integration also termed as the point of interface. The both data sets can be mixed in such a way that they depict the apparent picture of the underlying phenomenon same as when standing alone (Creswell, 2013). More specifically, quantitative and qualitative strands can be integrated in such a way that both strands do not overlook important implication thus it extends the synergic effect in findings and analysis (Woolley, 2009). In a mixed-methods study, qualitative and quantitative data can be mixed by one of four ways: i) merging the two data sets; ii) connecting analysis of one data set to the collection of a second data set iii) data embedding of one type within a larger design; iv) using the theoretical framework to combine the two data sets.

Figure 4.9: The Convergent Parallel Design – Creswell (2013)



In this study, the researcher keeps the two strands (see Figure 4.8) independent and the both quantitative and qualitative strands execute distinctively. The quantitative data collected through electronic and paper based survey while semi-structured interviews conducted for the qualitative data. In quantitative analysis, the adequacy of the hypothesised relationship assessed through structural equation modelling (SEM) with the help of statistical package IBM AMOS v19. Whereas, the researcher used Nvivo for managing and analysing qualitative data collected during semi-structured interviews with senior managers and human resource heads of three commercial banks in Karachi. The results of the quantitative study (see Chapter 5) and results of a qualitative study (see Chapter 6) are reported separately. However,

the mixing of the two strands occurs in the final step during discussion (see Chapter 7) and conclusion (see Chapter 8) stage.

More specifically, data mixing in the final stage of study allows researchers drawing conclusions or inferences that reflect what was learned from the combination of results from the two strands of the study, such as by comparing or synthesising the results in a discussion (Creswell, 2013). For instance, the analysis of quantitative and qualitative data seeks to bring the data together in order to answer the set of research questions unable to be effectively answered by the individual methods.

The mixed-methods designs keep the two strands independent, this is the only point in the research process where mixing occurs. In this study, both quantitative and qualitative study findings are compared and contrasted at the last stage using convergent parallel design (see Figure 4.9). For implementing a convergent design, researcher followed the following four major steps outlined by Creswell (2013).

i) Data collection of both quantitative and qualitative data about the topic of interest.

ii) Data analysis of two data sets separately and independently using typical quantitative and qualitative procedures.

iii) Data merging and comparing the separate results relating the two data types during additional analysis.

iv) Data interpretation such a way that the two sets of results relate to each other, and/or combine to create a better understanding in response to the study's overall purpose.

The purpose of convergent design in this study is to obtain a complementary data for more extensiveness in overall results (Greene and Caracelli, 1997). For example, the use of both numerical and non-numerical data, however, complements each other in order to better understand the research problem at the point of making inferences.

The use of this design allows researchers to triangulate the quantitative design (e.g. large sample size, numbers, trends, and generalisation) with qualitative design (e.g. small sample size, text, descriptive details, and in depth) by directly comparing and contrasting both results for corroboration and validation purposes (Creswell, 2013).

In conclusion, the final decision of choosing a convergent design also made due to close semblance between design and study's objectives. For example; a) the researcher has limited time for collecting both strands of data in one visit to the field; b) the researcher strongly believes that collecting and analysing both quantitative and qualitative data to understand the problem equally important for this study; c) the researcher also has expertise in analysing both quantitative and qualitative data; d) the researcher also has ability to manage two streams of data in different data collection and analysis activities.

4.10 Protection of Human Participants

All research students should have to concede an ethical obligation as per code of professional conduct (Punch, 2005). Although, the ethical obligation in the social sciences has a less compelling impact than natural sciences, researcher must be responsible for providing ethical protection of all participants according to data protection act 1998 (Collis and Hussey, 2009). Therefore, confidentiality and anonymity assured at all levels of this study.

Researchers typically have a tendency to be reliable and systematic while developing the problem statement and research questions. Researchers, also tend to follow certain ethical issues in the problem statement as it is supposedly necessary to identify a research problem that can benefit all stakeholders explicitly or implicitly involved with the research. Therefore, for this study two phased pilot study has carried out to ascertain trust and understanding before final data collection (Creswell, 2009).

Many ethical obligations may also arise during the data collection stage (Creswell, 2009). Therefore, the researcher has ensured the physical, psychological, social, economic, or legal protection to the participants in a study (Sieber, 1973).

Ethical issues also arise during data analysis and interpretation (Creswell, 2009). It has suggested that the researcher must have to provide accurate information and avoid factual exaggeration (Berg, 2004). Meanwhile, researchers also have to ensure the confidentiality and privacy of respondents and do not reveal information that might identify respondents (Guthrie, 2010). Therefore, for this study researcher has taken all professional responsibility to protect respondent's culture, emotions, moral and legal standards.

4.11 Summary

In this chapter the researcher has summarised the methodological framework utilised to accomplish the aim and objectives of the research. It describes and explains the research design and research procedure that was employed to investigate the area of knowledge creation and the impact of organisational culture on it. It started from the philosophical stance of research with the choice of the survey method in relation to methods and approaches. Second, the rationale and employability of the research methods and research approach are illustrated. Third, the researcher developed a framework of a research instrument that was utilised in pursuit of the goals and validated the research instrument through a pilot study. Also, the sampling design and procedure in mixed-methods research is presented, along with data collection and analysis techniques.

CHAPTER 5
QUANTITATIVE DATA ANALYSIS

5.1 Introduction

Empirically, there is no single evaluation method or statistical tool on which everyone agrees (Hu and Bentler, 1999). Apparently, the wisdom of the researcher plays a more important role than any statistical tool. It is seemingly unwarranted if a researcher presumes that only inserting data into a statistical tool is sufficient, and the rest will be done by the tool. For that reason, a decision between different techniques is one of the critical aspects that will eventually reflect through the researcher's wisdom. Also, in some situations, a researcher's decision between the two techniques is not merely upon the researcher's wisdom but is based on the pre-set standards and techniques. In the last chapter, the methodological choice of this study is covered in terms of three mixed-methods design strategies namely: priority, implementation and integration. In this chapter, the procedure of a quantitative data analysis is summarised in three parts. The first part comprises of the analysis of demographic data followed by the scale validation of organisational culture and the knowledge creation instrument to assess the structural validity, reliability and uni-dimensionality of the scale. It also tests the validity of selected variables through the adequacy of the hypothesised factor structure. However, in the end, the hypothesis testing analysis uses the structural equation modeling (SEM) which has been briefly described.

5.2 Personal / Categorical Data Analysis

All respondents were asked a chain of personal and categorical questions in order to determine the appropriateness for inclusion in the study and present an overview of relevant beneficiaries (Howitt and Cramer, 2008). For this study, the sample is demographically distributed according to the employee's highest degree, job rank, major job function, length of service and number of trainings in the last three years. A total of three organisations participated in the study and almost 131 respondents completed the survey. Figure 5.1 shows the frequencies of responses according to the employee's highest degree. As shown, almost 7.3% of the participants hold a

doctorate degree, 56.1% have a Master's degree, 30.1% a graduate degree, 6.5% had an undergraduate degree and no participants had a technical training diploma.

Figure 5.1: Sample Composition According to Employee Highest Degree

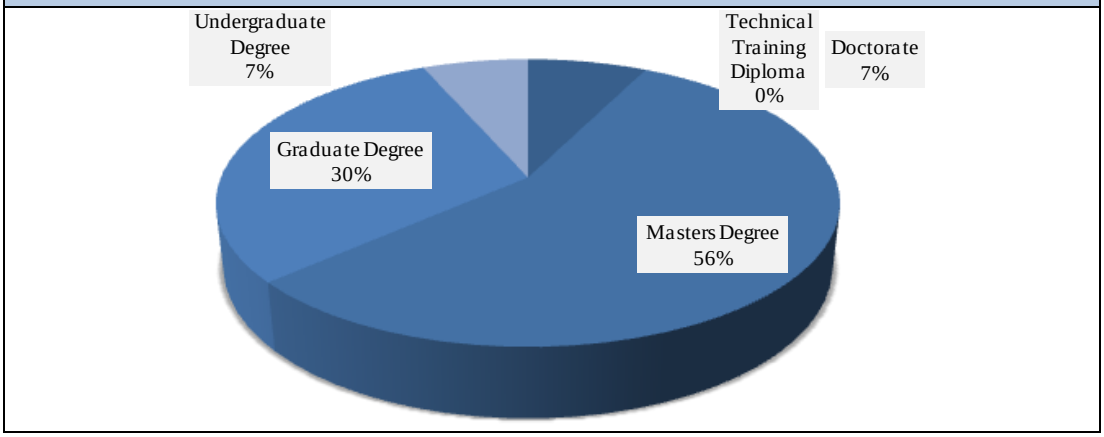


Figure 5.2: Sample Composition According to Employee Job Rank

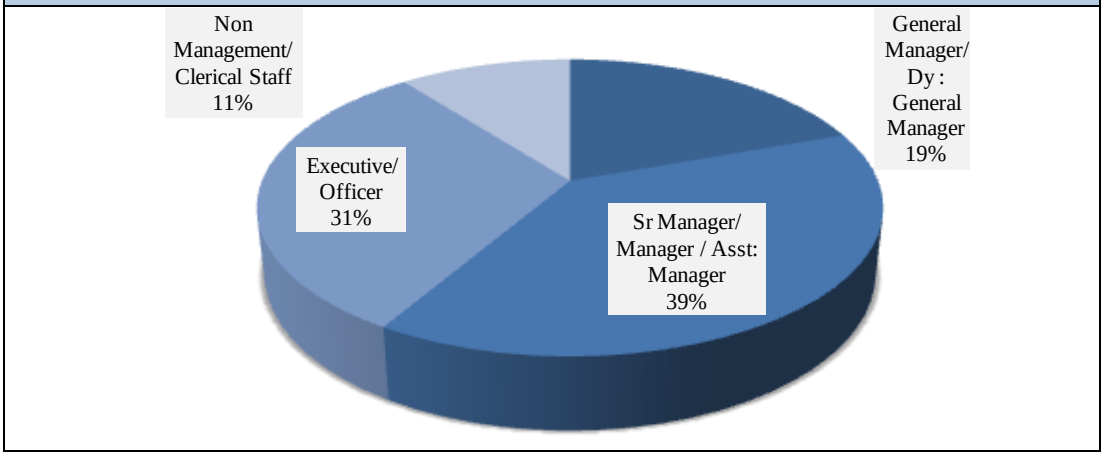


Figure 5.2 shows a sample composition according to the employees' job rank. For instance, it indicates that the 19.5% of the respondents were general managers and deputy general managers, 39% were senior managers, 30.9% were executives and officers and 10.6% were non-management or clerical staff. Figure 5.3 represents a sample composition according to the major functions of the job in the banking sector. As noted before, a sample for this quantitative survey was taken on the basis of the admissibility of the knowledge worker according to the employee functions of the job and the inclusion/exclusion criteria of this study (Gall et al., 2003). The frequencies of responses according to employee job functions show that almost 26.8% of the respondents belong to the human resource department, 11.4% are in

global operation, 29.3% work in the IT and systems, 18.7% are in learning and development and 13.8% work in marketing and brand management.

Figure 5.3: Sample Composition According to Employee Job Functions

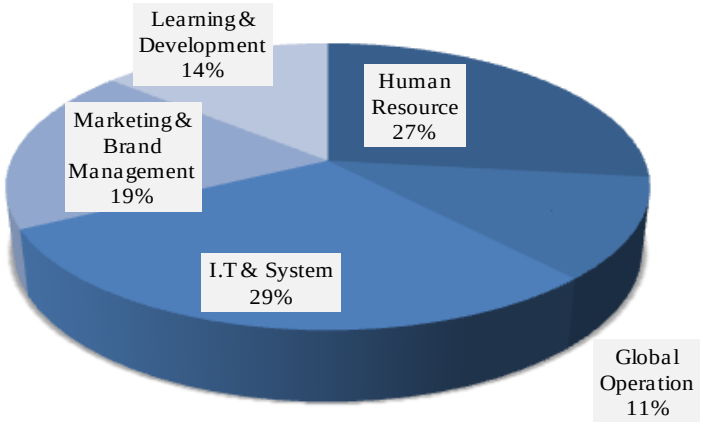


Figure 5.4 shows the frequencies of responses according to the employees' length of service with the current employer. As shown, almost 8.9% of employees hold less than a year's experience, 10.6% from 1 to 2 years, 15.4% from 2 to 3 years, 22.8% from 3 to 4 years, 23.6% from 4 to 5 years and 18.7% for over 5 years.

Figure 5.4: Sample Composition According to the Length of Service with Current Employer

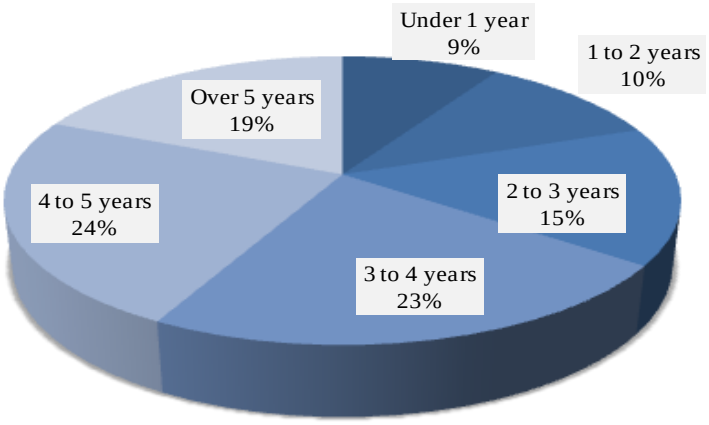
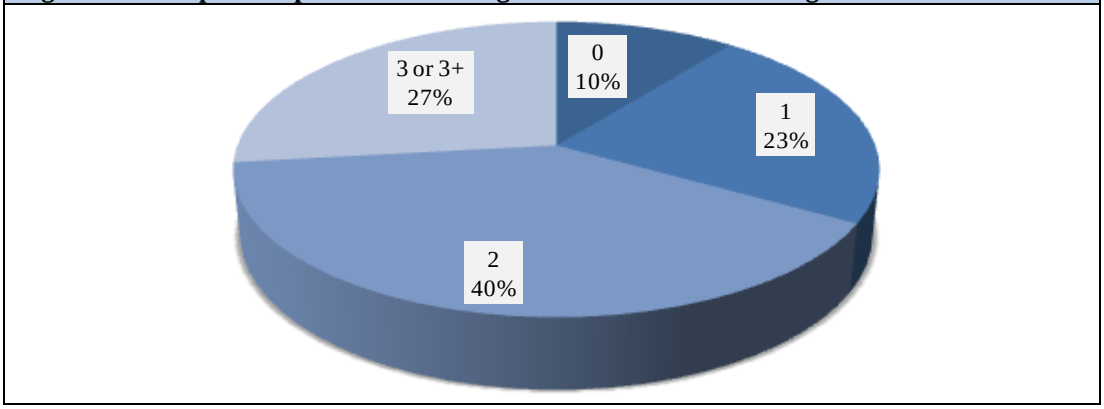


Figure 5.5 describes the sample composition according to the total number of employees who received training in three years. Available statistics shows that 10.6% of employees received no training, 22.8% received training once, 39.8% received two trainings and 26.8% received three or more periods of trainings in the last three years. In conclusion, the demographic data from 131 respondents of this cross-sectional study revealed a homogeneous pattern in terms of the frequency ratio.

In summary, it may be said that the typical respondent was highly educated, has significant experience at their current position in the middle and senior management level in administration, finance and HR level.

Figure 5.5: Sample Composition According to the Number of Trainings Received



5.3 Frequency Distribution, Descriptive Data & Data Normality

The results tabulated in Table 5.1, 5.2 and 5.3 presents the frequency distribution, descriptive data and data normality results of both organisational culture and knowledge creation constructs. In case of descriptive data, the purpose of this description is to summarise the pattern of the item-wise responses of the 5-point Likert scale anchored by strongly disagree, disagree, neither agree nor disagree, agree, and strongly agree.

Table 5.1: Frequency Distribution, Descriptive Data & Data Normality – OC

Factor	Frequency Distribution (%)					Descriptive Data		Data Normality	
	S.D	D	N	A	S.A	Mean	Std. Dev	Skew	Kurt
Involvement									
EMP1	3.8	10.5	6.0	42.9	36.8	3.98	1.09	-1.16	0.66
EMP2	3.0	6.8	12.8	47.4	30.1	3.94	0.98	-1.09	1.05
EMP3	1.5	12.0	8.3	34.6	43.6	4.06	1.06	-1.04	0.15
EMP4	2.3	6.8	7.5	47.4	36.1	4.08	0.95	-1.28	1.60
EMP5	21.8	15.0	24.1	20.3	18.8	2.99	1.41	-0.05	-1.25
TON1	3.0	10.5	12.0	43.6	30.8	3.88	1.05	-0.94	0.29
TON2	1.5	6.0	19.5	32.3	40.6	4.04	0.99	-0.84	0.11
TON3	3.0	12.8	9.8	51.1	23.3	3.78	1.03	-0.93	0.27
TON4	26.3	16.5	27.1	13.5	16.5	2.77	1.40	-0.19	-1.17
TON5	2.3	6.8	15.8	39.8	35.3	3.99	0.99	-0.96	0.56
CDT1	2.3	6.0	15.0	46.6	30.1	3.96	0.94	-1.00	0.97
CDT2	0.8	8.3	16.5	35.3	39.1	4.03	0.98	-0.81	-0.10
CDT3	3.8	3.0	16.5	51.9	24.8	3.90	0.93	-1.18	1.88
CDT4	0.03	11.0	12.8	39.1	36.8	4.01	0.97	-0.77	-0.35
CDT5	20.3	9.0	32.3	21.1	17.3	3.06	1.34	-0.18	-1.02
Consistency									
CVS1	21.8	12.0	20.3	18.8	27.1	3.17	1.50	-0.20	-1.36
CVS2	3.0	6.0	12.8	33.8	44.4	4.10	1.03	-1.20	0.95

CVS3	0.09	6.0	9.0	46.6	38.3	4.17	0.83	-0.97	0.68
CVS4	1.5	6.0	7.5	39.8	45.1	4.21	0.92	-1.35	1.68
CVS5	0.8	4.5	15.0	43.6	36.1	4.09	0.86	-0.89	0.66
AGT1	19.5	12.0	21.8	18.0	28.6	3.24	1.47	-0.25	-1.29
AGT2	5.3	8.3	5.3	35.3	45.9	4.08	1.14	-1.35	0.99
AGT3	4.5	5.3	12.0	51.1	27.1	3.90	1.00	-1.23	1.50
AGT4	3.0	7.5	14.3	31.6	43.6	4.05	1.07	-1.07	0.45
AGT5	2.3	6.8	14.3	45.1	31.6	3.96	0.96	-1.00	0.82
CIN1	3.0	7.5	10.5	46.6	32.3	3.97	1.00	-1.14	1.05
CIN2	0.8	4.5	17.3	33.8	43.6	4.15	0.91	-0.90	0.26
CIN3	2.3	9.8	7.5	55.6	24.8	3.90	0.95	-1.13	1.10
CIN4	20.3	29.3	21.8	15.0	13.5	2.72	1.31	0.34	-0.99
CIN5	1.5	5.3	13.5	42.1	37.6	4.09	0.92	-1.05	1.00
S.D = Strongly Disagree, D = Disagree, N = Neither agree nor disagree, A = Agree, S.A = Strongly Agree									

Although that the maximum likelihood method can also be used for data with minor deviations from normality (Raykov and Widaman, 1995); the maximum likelihood estimation method is fairly robust to violate the normality of the data (Hair et al., 2010). Therefore, the values of both skewness and kurtosis also included in order to save the useful explanations of the variables in the model. Hence, following the suggested benchmark of West et al., (1995) normality of the observed variables (i.e. univariate skewness ≤ 2 and univariate kurtosis ≤ 7) has been checked. In the case of data used in this study, the univariate skewness and univariate kurtosis of each variable indicates the evidence of normally distributed data.

Table 5.2: Frequency Distribution, Descriptive Data & Data Normality – OC

Factor	Frequency Distribution (%)					Descriptive Data		Data Normality	
	S.D	D	N	A	S.A	Mean	Std. Dev	Skew	Kurt
Adaptability									
OCH1	21.8	13.5	19.5	16.5	28.6	3.16	1.51	-0.16	-1.41
OCH2	1.5	9.8	21.8	33.1	33.8	3.87	1.03	-0.62	-0.41
OCH3	1.5	8.3	15.8	48.9	25.6	3.88	0.93	-0.84	0.50
OCH4	2.3	11.3	15.8	38.3	32.3	3.87	1.06	-0.78	-0.13
OCH5	2.3	9.8	16.5	38.3	33.1	3.90	1.04	-0.81	0.01
CFS1	2.3	9.0	6.8	33.8	48.1	4.16	1.04	-1.30	0.99
CFS2	19.5	17.3	20.3	20.3	22.6	3.09	1.43	-0.09	-1.31
CFS3	3.8	9.8	9.0	49.6	27.8	3.87	1.04	-1.09	0.73
CFS4	3.8	7.5	6.8	36.1	45.9	4.12	1.07	-1.37	1.26
CFS5	4.5	7.5	14.3	40.6	33.1	3.90	1.08	-1.02	0.53
OLG1	2.3	12.8	18.0	44.4	22.6	3.72	1.02	-0.66	-0.19
OLG2	19.5	16.5	18.8	19.5	25.6	3.15	1.46	-0.14	-1.35
OLG3	0.8	8.3	15.0	39.8	36.1	4.02	0.95	-0.83	0.78
OLG4	3.0	10.5	14.3	42.9	29.3	3.84	1.05	-0.87	0.16
OLG5	2.3	9.0	17.3	44.4	27.1	3.84	0.99	-0.81	0.25
Mission									
SDI1	3.0	3.8	12.0	43.6	37.6	4.09	0.95	-1.28	1.81
SDI2	3.8	7.5	5.3	42.1	41.4	4.09	1.05	-1.39	1.48

SDI3	1.5	4.5	11.3	42.9	39.8	4.15	0.90	-1.18	1.50
SDI4	2.3	6.8	6.8	46.6	37.6	4.10	0.95	-1.32	1.69
SDI5	27.8	15.8	18.8	15.8	21.8	2.87	1.51	0.10	-1.43
GOB1	3.0	8.3	13.5	41.4	33.8	3.94	1.03	-1.00	0.52
GOB2	1.5	9.0	12.8	35.3	41.4	4.06	1.02	-0.99	0.26
GOB3	2.3	9.8	14.3	45.1	28.6	3.87	1.00	-0.88	0.31
GOB4	27.1	12.0	24.8	14.3	21.8	2.91	1.49	0.04	-1.36
GOB5	3.0	8.3	12.0	33.8	42.9	4.05	1.07	-1.10	0.53
VIS1	2.3	6.0	6.0	40.6	45.1	4.20	0.95	-1.46	2.03
VIS2	2.3	6.0	6.8	47.4	37.6	4.12	0.93	-1.36	1.95
VIS3	22.6	12.8	21.1	17.3	26.3	3.12	1.50	-0.14	-1.38
VIS4	3.8	2.3	6.0	37.6	50.4	4.28	0.95	-1.81	3.56
VIS5	2.3	4.5	7.5	43.6	42.1	4.18	0.92	-1.44	2.31

Table 5.3: Frequency Distribution, Descriptive Data & Data Normality – KC

Factor	Frequency Distribution (%)					Descriptive Data		Data Normality	
	S.D	D	N	A	S.A	Mean	Std. Dev	Skew	Kurt
Socialisation									
SOC1	0.8	9.2	9.2	47.3	33.6	4.03	0.93	-1.00	0.60
SOC2	0.03	9.1	9.0	34.3	47.3	4.19	0.94	-1.06	0.22
SOC3	1.5	9.2	7.6	45.0	36.6	4.06	0.97	-1.13	0.87
SOC4	1.5	6.9	9.9	45.8	35.9	4.07	0.93	-1.13	1.15
SOC5	0.8	8.4	7.6	42.7	40.5	4.13	0.93	-1.14	0.86
SOC6	22.1	5.3	28.2	23.7	20.6	3.15	1.41	-0.30	-1.11
SOC7	22.1	5.3	28.2	23.7	20.6	3.20	1.35	-0.28	-1.00
Externalisation									
EXT1	0.8	7.6	16.0	50.4	25.2	3.91	0.88	-0.77	0.42
EXT2	1.5	13.0	10.7	40.5	34.4	3.93	1.05	-0.86	-0.10
EXT3	0.02	9.1	16.0	42.6	32.1	3.97	0.92	-0.66	-0.32
EXT4	18.3	16.0	24.4	24.4	16.8	3.05	1.34	-0.13	-1.14
EXT5	0.00	10.7	11.5	44.3	33.6	4.00	0.94	-0.80	-0.13
EXT6	15.3	20.6	24.4	19.8	19.8	3.08	1.34	-0.04	-1.15
EXT7	0.8	10.7	13.0	40.5	35.1	3.98	0.99	-0.83	-0.06
Combination									
COM1	1.5	9.9	7.6	43.5	37.4	4.05	0.99	-1.18	0.68
COM2	0.0	3.1	15.3	41.2	40.5	4.19	0.80	-0.72	-0.09
COM3	26.0	9.2	25.2	20.6	19.1	2.97	1.45	-0.09	-1.30
COM4	2.3	9.2	7.6	43.5	37.4	4.04	1.01	-1.17	0.89
COM5	0.8	8.4	7.6	38.2	45.0	4.18	0.95	-1.19	0.85
COM6	0.8	3.8	11.5	45.8	38.2	4.16	0.83	-1.05	1.32
COM7	26.7	6.1	25.2	21.4	20.6	3.03	1.47	-0.16	-1.32
Internalisation									
INT1	1.5	6.9	7.6	45.8	38.2	4.12	0.92	-1.24	1.46
INT2	1.5	3.8	14.5	38.9	41.2	4.14	0.91	-1.09	1.14
INT3	26.7	6.1	22.1	21.4	23.7	3.09	1.51	-0.21	-1.37
INT4	0.8	6.9	11.5	41.2	39.7	4.12	0.92	-1.02	0.66
INT5	23.7	8.4	28.2	19.1	20.6	3.04	1.43	-0.14	-1.22
INT6	0.8	8.4	6.9	48.9	35.1	4.09	0.90	-1.12	1.05
INT7	1.5	4.6	10.7	39.7	43.5	4.19	0.91	-1.25	1.55

5.4 Assessment of Non-Response Bias

For assessing the non-response bias between paper and electronic survey responses, the instructions of Armstrong and Overton (1977) have been followed. For this purpose, t-values of the 69 paper responses are compared to the t-values of the 64 electronic responses. The independent samples t-tests analysis was performed in the SPSS to confirm the existence or absence of bias.

Figure 5.6: Assessment of Non-Response Bias

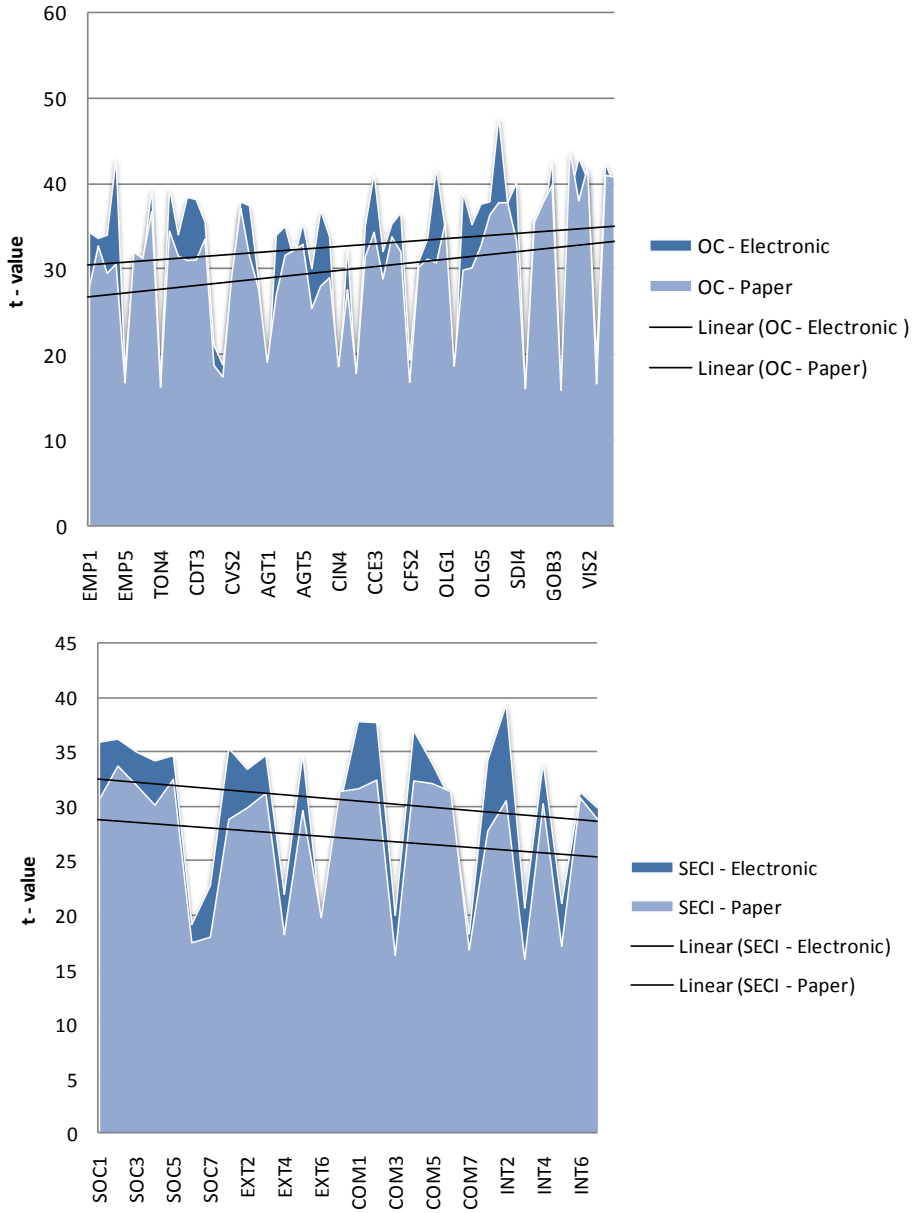


Figure 5.6 shows the graphical comparison of t-values between electronic and paper responses. As shown, both of the OC and KC scales represent some sort of difference in terms of the response between the two groups. For example, in case of knowledge creation scale, out of 28 questions only three i.e. SOC1, INT1 and INT2 found to be significantly different in response between the two groups. For example, SOC1 (t elec: 36.05 ≥ t paper: 30.70); INT1 (t elec: 34.35 ≥ t paper: 27.79); INT2 (t elec: 39.52 ≥ t paper: 30.57) reported significantly higher score in the electronic survey than the paper survey. However, in case of organisational culture scale, out of 60 questions only three i.e. EMP4, CFS5 and SDI2 found to be significantly different in response between the two groups. For example, EMP4 (t elec: 43.20 ≥ t paper: 30.68); CFS5 (t elec: 42.01 ≥ t paper: 30.81); SDI2 (t elec: 47.99 ≥ t paper: 37.86) reported significantly higher score in the electronic survey than the paper survey. The comparison of both scales in terms of t-values analysis of electronic and paper survey results, however, indicates the evidence of minor non-response bias that can be removed during factor analysis. Therefore, factor analysis in the subsequent section could be useful before hypothesis testing in order to eliminate the items that might contain high measurement error.

5.5 Development and Validation of Scale

Scale validation is an important aspect of any research. Empirically, it is difficult to ensure the soundness of research without determining the reliability and validity of the scale (Sureshchandar et al., 2002). Also, collecting data in different countries and cultures through a borrowed instrument is a highly complex phenomenon. In this course, the researcher can anticipate a variety of complications such as the quality of the factor structure and low construct validity. Nevertheless, the lack of empirically validated scales for measuring intense relationships like organisational culture and knowledge creation in Pakistani banking organisational context may also create certain validity issues (DeVellis, 2003 and Thompson, 2004; Song et al., 2011). Generally, if any scale has never been tested before or the relationship between observed and latent variables has not been theoretically established then an exploratory factor analysis is the only choice (Ahire and Devaraj, 2001). In other words, the exploratory factor analysis (EFA) is a data-driven approach in which each

common factor is assumed to affect every observed variable and that the common factors are either correlated or uncorrelated (Brown, 2006). Once the model is estimated then the factor scores and proxies of latent variables are calculated and used for follow-up analysis (Albright and Park, 2009). In contrast, a confirmatory factor analysis (CFA) is a theory- or hypothesis-driven. The CFA allows researchers to test the hypotheses about a particular factor structure. In addition, a confirmatory factor analysis (CFA) is a comprehensive statistical technique that determines the validity of theoretical structures through testing the causal links among variables (Anderson and Gerbing, 1991; Burnette and Williams, 2005; Kline, 2011).

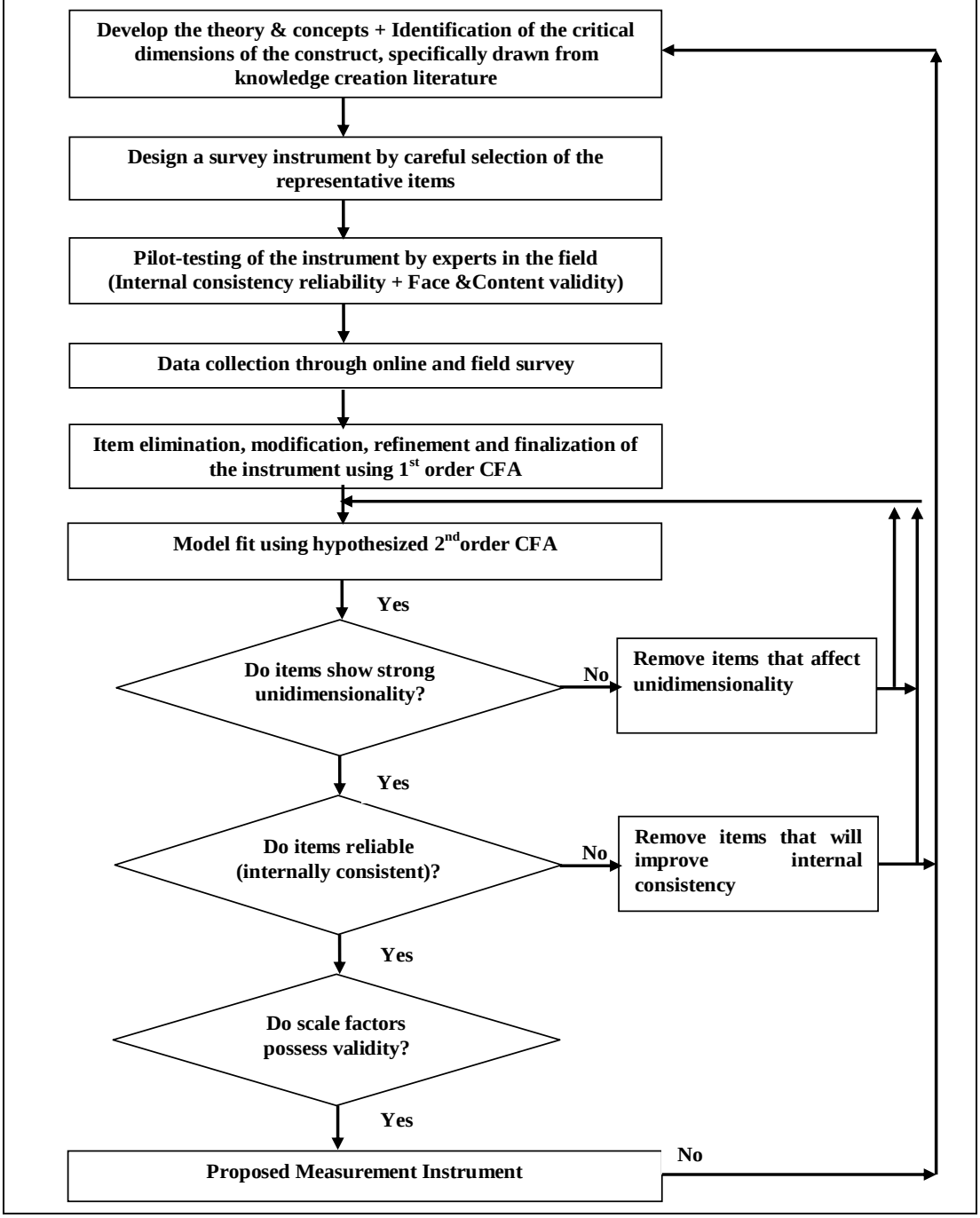
Table 5.4: Comparative Framework of EFA and CFA – Albright and Park (2009)

Parameter	EFA	CFA
Scope	Data-driven	Theory-driven
Constraint	N/A	Yes
Un-standardised solution	N/A	Yes
Standardised solution	Yes	Yes
Factor rotation	Yes	N/A
Factor scores	Yes	N/A
Hypothesis test	N/A	Yes
Good of fit	N/A	Yes
Software Package	General purpose software	LISREL, AMOS, EQS, MPLUS

Table 5.4 summarises the differences and similarities of EFA and CFA. In CFA, the researchers are required to devise a hypothesis because CFA allows the researcher to specify a model on the basis of logic or 'priori'. For that reason, researchers first devise some hypothetical model and then test the inference that corroborates the relationship between observed and the latent variables (Sureshchandar et al., 2002). Hence, a reasonable prior knowledge of factors that clarify the interrelationship among the measured variables is an integral part of CFA. In this connection, CFA is more suitable than any other method such as EFA because it builds on the logic; particularly when a researcher has a reasonably good prior knowledge about observed variables and other theoretical findings (Bentler, 1995). It is a matter of fact that both organisational culture and knowledge creation models are not only theoretically established, but also empirically tested in previous studies. Therefore, confirmatory factor analysis will be utilised for scale refinement and validation purposes. However, a typical structural equation model consists of two components: a) measurement model; and b) structural model. CFA is a measurement model. It

illustrates the relationships between a set of observed (or dependent) variables and a set of continuous latent variables. In this study, a confirmatory factor analysis (CFA) model with a first-order factor structure (or continuous factor indicators) and a second-order factor analysis models are estimated.

Figure 5.7: Process of Scale Validation - Sureshchandar et al., (2002)



More specifically, the first-order CFA was used to assess the structural validity, reliability and dimensionality of the scale. Whereas the second-order CFA was used

to assess the model fit of a hypothesised second-order factors (Joreskog and Sorbom, 1996; Yang, 2005). According to Byrne (2001), the second-order CFA is potentially applicable when the first-order CFA signifies a higher inter-correlation among the factors. In the following, the first- and second-order confirmatory factor analysis of both organisational culture and knowledge creation instruments is explained. However, for scale refinement and validation in this study, the researcher followed the instructions of Sureshchandar et al., (2002). As shown in Figure 5.7, reliability and validity of the scales are established in both the pilot study (prior to data collection) phase and the post-hoc scale development phase. In the pilot testing phase, face and content validity are measured. Whereas, in post-hoc scale development phase, convergent validity and discriminate validity are measured using the confirmatory factor analysis approach. In the following, several measures of reliability and validity used in this study are summarised.

5.6 Reliability & Validity Analysis

Reliability and validity measurement is an important tool that increases research credibility on the one side and reduce the likelihood of fabricated results in the other (Winter, 2000). Researchers are measuring reliability and validity for sameness of any measurement scale (Sureshchandar et al., 2002). In the following, several measures of reliability and validity used in this study are summarised.

5.7 Reliability

Reliability is the ability to yield consistent results (Nunnally, 2010). In this study, the reliability of the scale measured in two phases. Firstly in the pilot study phase and secondly after conducting confirmatory factor analysis. Numerically, reliability can be measured by various methods such as, split halve, test reset, internal consistency and equivalent form. In the pilot study phase of this study, reliability of the scale measured using an internal consistency method. Sureshchandar et al., (2002) and Nunnally (2010) found internal consistency as one of the effective and commonly used techniques especially in field studies. Nevertheless, while measuring construct reliability (CR) after the CFA, the researcher first squared the sum of factor loadings and then divided by the sum of factor loadings plus sum of standardized error

variance (δ). Measuring composite reliability (CR) using this method not only assess the reliability of the manifest indicators, but also used as an alternative for determining measurement model fit. Since, results and analysis of the both reliability techniques are summarised in the ensuing section.

5.7.1 Reliability of Scale in the Pilot Study Phase

The online survey during the pilot study initiated on May 2012 and completed in July 2012. For this purpose, the researcher sent HTML link of electronic survey to 75 bank employees from the target population of the banking industry on a convenience basis. Almost, 36 respondents completed the online survey, but 7 of them were rejected due to unfinished answers. Hence, the response rate of this phase remained (29 / 75 × 100 = 38.6%). These 29 responses then utilised to measure reliability using the internal consistency method. Since, internal consistency of the dependent and independent variables (3 scales, 16 indexes 100 items) measured with SPSS-19. In the following, statistical results and theoretical analysis of coefficient alpha (α) values of each index and composite alpha (α) values of each dimension are precisely reviewed. In addition, the results and theoretical analysis of mean values and standard deviation of each item are also discussed.

Table 5.5: Cronbach Alpha Coefficients and Descriptive Statistics of Involvement

Index	Code	Items	Mean	SD (σ)
Involvement: Composite Reliability = α = 0.911				
Empowerment α = 0.743	EMP1	Most employees are highly involved in their work	3.13	0.99
	EMP2	Decisions are usually made at the level where the best information is available	2.75	1.09
	EMP3	Information is widely shared so that everyone can get the information he or she needs when it's needed	3.13	1.21
	EMP4	Everyone believes that he or she can have a positive impact	2.93	1.03
n = 29	EMP5	Work planning is ongoing and our manager involves everyone in the process to some degree	3.03	1.11
Team Orientation α = 0.842	TON1	Cooperation across different parts of the bank is highly encouraged	3.20	1.23
	TON2	In my bank staff work like they are part of a team	3.31	1.10
	TON3	Teamwork is used to get work done, rather than hierarchy	3.27	1.16

n = 29	TON4	Teams are our primary building blocks	3.20	1.14
	TON5	Work is organised so that each person can see the relationship between his or her job and the goals of the organisation	3.10	1.20
Capability Development α = 0.743	CDT1	Authority is delegated so that staff can act their own	3.06	1.13
	CDT2	The capability of performing my work is constantly improving	3.13	0.95
	CDT3	There is continuous investment in the skills of the employees	3.34	1.20
	CDT4	The capabilities of staff are viewed as an important source of competitive advantage	3.48	1.27
n = 29	CDT5	Problems often arise because we do not have the necessary skills to do our routine work	3.00	1.25

Involvement: Internal consistency can be measured using reliability coefficient labelled 'Cronbach alpha' (α) (Cronbach, 1951). The results summarised in the Table 5.5 shows the coefficient alpha (α) values of each index (α = 0.743, α = 0.842 and α = 0.743) and the composite reliability of involvement (α = 0.911) were higher than the suggested minimum threshold limit of 0.60 (Baker et al., 2002 and Bagozzi and Yi, 1988).

Table 5.6: Cronbach Alpha Coefficients and Descriptive Statistics of Consistency

Index	Code	Items	Mean	SD (σ)
Consistency: Composite Reliability = α = 0.912				
Core Values α = 0.814	CVS1	The senior management of the bank "practice what they preach"	3.13	1.15
	CVS2	There is a different management styles and practices	3.86	1.18
	CVS3	Ignoring core values will get you in trouble	3.44	1.12
	CVS4	There is a clear and consistent set of values that governs the way we do our job	3.55	1.21
n = 29	CVS5	There is an ethical code that guides our behaviour and tells us right from wrong	3.34	1.04
Agreement α = 0.655	AGT1	When disagreements occur, we work hard to achieve "win-win" solutions	3.03	1.05
	AGT2	There is a friendly corporate culture	2.75	1.02
	AGT3	It is easy to reach consensus, even on difficult issues	3.34	1.04
	AGT4	We often have trouble reaching agreement on key issues	3.37	1.01
n = 29	AGT5	There is a clear agreement about the right way and the wrong way to do things	3.34	1.04

Coordination & Integration α = 0.866	CIN1	Our approach to do routine work is very consistent and usual	3.58	1.08
	CIN2	People from different parts of the bank share a common point of view	3.51	1.12
	CIN3	It is easy to coordinate activities across different parts of the bank	3.72	0.99
	CIN4	Working with someone from another part of this bank is like working with someone from a different bank	3.51	1.18
n = 29	CIN5	There is good alignment of goals across levels	3.72	1.03

All of α value represents an adequate reliability values in their original form. Additionally, reliability is the measure of inter-correlations between the items that constitute a scale (Sureshchandar et al., 2002 and Nunnally, 2010). Therefore, inter-item correlation also included in the analysis. Since, all the results in the range of 0.09 to 0.73 represent the strong positive interrelationship between 15 items and 3 indexes of involvement (Hatcher, 1994). The average mean score of the involvement is calculated in the range of 2.75 to 3.48. Whereas, higher (σ = 1.27) and lower (σ = 0.95) standard deviation values show the small variation (or dispersion) from the average mean value on 5-point Likert scale.

Table 5.7: Cronbach Alpha Coefficients and Descriptive Statistics of Adaptability

Index	Code	Items	Mean	SD (σ)
Adaptability: Composite Reliability = α = 0.919				
Organisational Change α = 0.767	OCH1	The way things are done is very flexible and easy to change	3.41	1.42
	OCH2	We respond well to competitors and other changes in the banking environment	4.10	1.08
	OCH3	New and improved ways to do work are continually adopted	4.20	0.94
	OCH4	Attempts to create change usually meet with resistance	4.10	1.08
n = 29	OCH5	Different parts of the bank often cooperate to create change	4.24	0.98
Customer Focus α = 0.743	CFS1	Customer comments and recommendations often lead to changes	2.79	1.29
	CFS2	Customer input directly influences our decisions	4.17	1.03
	CFS3	All members have a deep understanding of customer wants and needs	4.00	0.92
	CFS4	The interests of the customer often get ignored in our decisions	4.27	1.09
n = 29	CFS5	We encourage direct contact with customers by our people	4.00	1.00

Organisational Learning α = 0.924 n = 29	OLG1	We view failure as an opportunity for learning and improvement	3.31	1.28
	OLG2	Innovation and risk taking are encouraged and rewarded by management	3.44	1.32
	OLG3	Lots of things are neglected or often overlooked	3.55	1.29
	OLG4	Learning is an important objective in our day-to-day work	3.37	1.47
	OLG5	We make certain that the "right hand knows what the left hand is doing"	3.65	1.14

Consistency: As illustrated in Table 5.6, coefficient alpha (α) values of each index (α = 0.814, α = 0.655 and α = 0.866) and the [7]composite reliability of consistency (α = 0.912) were higher than the suggested minimum threshold limit of 0.60 (Baker et al., 2002 and Bagozzi and Yi, 1988). This result indicates an acceptable evidence of scale's internal consistency and strong interrelationship between the 15 items of 3 indexes (Hatcher, 1994). The average mean score of the overall measurement of consistency is calculated in a range of 2.75 to 3.86. Also, higher (σ = 1.21) and lower (σ = 0.99) standard deviation values indicate the small variation (or dispersion) from the average mean value on 5-point Likert scale. As shown, all items in three indexes show a positive relationship. All the results in the range of 0.01 to 0.81 represent the best fit between indexes and items. However, the inter-item correlation matrix indicates that two items (AGT4 and AGT5) doesn't correlate positively with the other items. However, negative inter-item correlation has not reduced the value of the reliability coefficient. Thus, both item retained in the proceeding analysis.

Adaptability: As summarised in Table 5.7, the coefficient alpha (α) values of each index (α = 0.767, α = 0.743 and α = 0.924) and the composite reliability of involvement (α = 0.919) were higher than the suggested minimum threshold limit of 0.60 (Baker et al., 2002 and Bagozzi & Yi, 1988). Since, this result indicates an acceptable evidence of scale's internal consistency and strong interrelationship between the 15 items of 3 indexes (Hatcher, 1994). The average mean score of the overall measurement of adaptability is calculated in the range of 2.79 to 4.27. The lower (σ = 0.94) and higher (σ = 1.47) standard deviation values show the small

[7] Reliability of the composite (sum of items) is based on the average inter-item correlation or stepped-up reliability. It can be computed using **Spearman-Brown** formula for reliability i.e., rxx = k r(i,j) / [1+ (k-1) r(i,j)]

variation (or dispersion) from the average mean value of 5-point Likert scale. As shown, all items in three indexes indicate a predictive relationship. The inter-item correlation in the range of 0.01 to 0.91 represents the positive correlation between the indexes and items. However, a negative correlation of two items (OCH3 and CFS2) has not adversely impacted the value of the reliability coefficient.

Table 5.8: Cronbach Alpha Coefficients and Descriptive Statistics of Mission				
Index	**Code**	**Items**	**Mean**	**SD (σ)**
Mission: Composite Reliability = α = 0.915				
Strategic Direction & Intent α = 0.812	SDI1	There is a long-term knowledge strategy	4.17	0.96
	SDI2	The knowledge strategy of this bank leads other banks to change the way they compete in the sector	4.13	0.83
	SDI3	There is a clear mission that gives meaning and direction to our work	4.24	0.98
	SDI4	Bank has a clear strategy for the future	4.24	0.95
n = 29	SDI5	Our strategic direction is unclear to me	3.89	1.01
Goal & Objectives α = 0.691	GOB1	There is widespread agreement about goals	4.24	0.95
	GOB2	Management set goals that are ambitious, but realistic	3.96	1.01
	GOB3	The management has "gone on record" about the objectives we are trying to meet	4.27	1.06
	GOB4	We continuously track our progress against our stated goals	4.10	0.97
n = 29	GOB5	Employees understand what needs to be done for us to succeed in the long-run	3.10	1.39
Vision α = 0.908	VIS1	Bank has a shared vision of what the bank like to be in the future	3.75	1.29
	VIS2	Our bank is knowledge bank	3.68	1.07
	VIS3	Senior management is clear about long-term knowledge vision	3.79	1.08
	VIS4	Short-term thinking often compromises our long-term vision	3.58	1.18
n = 29	VIS5	The vision statement of this bank creates excitement and motivation for employees	3.44	1.24

Mission: The results summarised in Table 5.8 shows the coefficient alpha (α) values of each index (α = 0.812, α = 0.691 and α = 0.908) and the composite reliability of mission (α = 0.915) were higher than the suggested minimum threshold limit of 0.60 (Baker et al., 2002 and Bagozzi and Yi, 1988). This result indicates an acceptable evidence of scale's internal consistency and strong interrelationship between the 15

items of 3 indexes (Hatcher, 1994). The average mean score of the overall measurement of mission is calculated in the range of 3.10 to 4.27. All the results in the range of 0.59 to 0.71 represent the best fit between indexes and items. However, higher ($\sigma = 1.39$) and lower ($\sigma = 0.83$) standard deviation values indicates the small variation (or dispersion) from the average mean value of 5-point Likert scale.

Table 5.9: Cronbach Alpha Coefficients and Descriptive Statistics of Knowledge Creation

Index	Code	Items	Mean	SD (σ)
Knowledge Creation: Composite Reliability = α = 0.884				
Socialisation α = 0.849	SOC1	During discussion, I try to find out others' opinions, concepts, thoughts or ideas	3.13	0.99
	SOC2	During discussion, I often encourage others to express their concepts, thoughts or ideas	2.75	1.09
	SOC3	My colleagues and I will actively share life or work experience with each other	3.13	1.21
	SOC4	I gather information from other departments	2.93	1.03
	SOC5	Before discussion, I will collect necessary information and show it to my colleagues	3.03	1.11
	SOC6	I like to get to know the people whom I will work with before going into a project together	3.20	1.23
n = 29	SOC7	Our team collects work-related information and ideas from (in) formal relationships with other people	3.31	1.10
Externalisation α = 0.865	EXT1	When others can't understand me, I am usually able to give him/her examples to help explaining	3.20	1.14
	EXT2	Most of the time, I can transcribe some of the unorganised thoughts into concrete ideas	3.10	1.20
	EXT3	I tend to describe professional or technical terms with conversational language to help communication	3.06	1.13
	EXT4	I tend to use analogy when expressing abstract or (theoretical) concepts	3.13	0.95
	EXT5	I will help others to clearly expressing what he/she has in mind by encouraging them to continue what they are saying	3.34	1.20
	EXT6	Our team develops new ideas through constructive dialogue by using figures and diagrams	3.48	1.27
n = 29	EXT7	I facilitate creative and constructive conversation among group members	3.00	1.25
Combination α = 0.802	COM1	During the discussion, I tend to help organise ideas and make conclusion to facilitate the discussion	3.44	1.12
	COM2	When coming across problems, I tend to use my experience to help solving problems	3.55	1.21
	COM3	After every event, I have the habit of organising and making summary of what happened	3.34	1.04
	COM4	During discussion, I usually organise everyone's thoughts in my mind	3.03	1.05
	COM5	I like to collect new information, and making connection of new and old knowledge to work up new concepts	2.75	1.02

n = 29	COM6	I engage in developing criteria to determine the value of new concepts	3.34	1.04
	COM7	Our team conducts experiments and shares the newly developed concepts with the entire organisation to evaluate value of concepts	3.37	1.01
Internalisation α = 0.749	INT1	After hearing a new idea or concept, I tend to compare it with my experience to help me comprehend the meaning	3.10	1.14
	INT2	I understand others' thoughts better by repeating what they said and asking them "Is this what you mean?"	2.72	1.03
	INT3	I will tell others what I think to make sure my understanding is the same as theirs	3.10	1.26
	INT4	When I have finished saying something, I will ask the other person if it is necessary to repeat to make sure he/she understands exactly what I mean	2.96	1.08
	INT5	Our team-members use newly learned knowledge as the sources for the next time applications	2.75	1.09
	INT6	When communicating with others, I will give others time to think about what we just discussed	3.10	1.14
n = 29	INT7	We combine existing and new concepts in meaningful ways	3.10	1.10

Knowledge Creation: As summarised in Table 5.9, coefficient alpha (α) values of each index (α = 0.849, α = 0.865, α = 0.802 and α = 0.749) and the composite reliability of knowledge creation (α = 0.884) were higher than the suggested minimum threshold limit of 0.60 (Baker et al., 2002 and Bagozzi and Yi, 1988). Since, this result indicates an acceptable evidence of scale's internal consistency and strong interrelationship between 50 items and 4 knowledge creation indexes (Hatcher, 1994). The average mean score of the overall scale is calculated in the range of 2.72 to 3.48.

In addition, the pilot study result indicates that, on average, people promote others to express their concepts, thoughts or ideas. It also reveals that, almost 4 out of 5 banking employees collect new information, making connection of new and old knowledge and engage in developing criteria to determine the value of new concepts that may be the sources for the next time applications. However, higher (σ = 1.26) and lower (σ = 0.95) standard deviation values indicate the small variation (or dispersion) from the average mean value of 5-point Likert scale.

5.8 Validity

Validity ensures the soundness of research. A piece of research is considered to be valid when it measures what it is supposed to measure (Greenfield, 2002 and Saunders et al., 2011). According to Hashim et al. (2007) validity refers to the methodological soundness and the appropriateness of the instruments. An important aspect of any piece of research should always be a degree of validity present in the procedures and conclusions (Graziano and Raulin, 2006). However, the concept of validity should not be reserved for research instruments alone though the principle is equally as important when applied to software, models or frameworks (Kitchenham et al., 1995). In general, invalidity put the trustworthiness of research in question. Thus, it ruins the researcher confidence on findings. In other words, validity is the degree to which the results of a piece of research exactly reflect the situation being researched (Babbie, 1998).

Paradoxically, scholastics are perplexed with respect to the various types of validities. Nevertheless, people have the same opinion that, different validity types that have been devised as a part of reasonable research methodology. In the literature, validity is divided into two broad categories namely, translation validity and criterion-related validity. However, [8]translation validity is divided into two sub categories i.e. i) face validity and ii) content validity. Whereas [9]criterion-related validity is divided into four sub-categories i.e., i) predictive validity, ii) concurrent validity, iii) convergent validity and iv) discriminate validity.

In this study, the validity of the scale has been established in the pilot study (prior to data collection) phase and post-hoc measure development phase. In pilot testing phase, face and content validity are measured. Whereas, in post-hoc scale validation

[8] In **translation validity**, you focus on whether method and design is a good reflection of the construct. This approach is definitional in nature. It assumes you have a good detailed definition of the construct and that you can check the method and design against it.

[9] In **criterion-related validity**, you examine whether the method and design behaves the way it should given your theory of the construct. This is a more relational approach to construct validity. It assumes that, your method and design should function in predictable ways in relation to other method and design based upon your theory of the construct.

phase, convergent validity and discriminate validity are measured using confirmatory factor analysis approach. In the following, several measures of validity used in this study are summarised.

5.8.1 Validity of the Scale in the Pilot Study Phase

5.8.1.1 Face Validity

Unlike other scientific methods, the face validity is least scientific or non-scientific method of measuring the validity. Since, it focuses on subjective judgments and does not measure using statistical methods. More specifically, the purpose of such type of measurement is to examine how survey appears to be valid for respondents and whether or not subjective judgment can be made by the researcher. For measuring of the face validity, questionnaire sent to 50 PhD students of three U.K Universities (Queen Margaret, Swansea, Northumbria and London Metropolitan) and two Universities (S.A.L.U and SZABIST) in Pakistan. The underlying objective of this phase was to inspect language issues and face validation of the questionnaire and to ensure that whether participants understand survey questions or any further amendments and proofing mistakes are still required. All the responses checked precisely, and each item reviewed for the use of familiar words. In addition, respondents are also asked for their feedback and all of the suggestions vigilantly incorporated in the final version of the survey.

5.8.1.2 Content Validity

Content validity refers to the extent to which an instrument provides an adequate demonstration of the conceptual underpinning that is intended to cover. Like face validity, content validity also provides subjective justification than empirical or statistical evidence. For the purpose of the content validity check, an initial draft of a survey sent to one senior HR manager based at commercial bank in Pakistan, and the other one sent to final year PhD scholar majoring in HRD based at Swansea University U.K. The underlying purpose behind such check is to eradicate any vagueness regarding the important areas related to organisational culture and knowledge creation. Since, most of research on knowledge creation is based on a

western perspective and no significant standard available for developing countries. Therefore, during the pilot study, researcher obtained useful feedback from the experts that later used in order to improve and refine survey. Since, we have made various changes in the initial draft by incorporating feedback and comments of respondents. In this regard, seven wording issues were identified in three cultural dimensions such as capability development, core values and organisational learning. These wording issues were resolved by replacing simple words with confusing quotations. Similarly, at one occasion we also merged two items into one item and completely removed one item in the socialisation mode.

5.9 Reliability and Validity in the Post-Hoc Scale Validation Phase

In the post-hoc scale validation phase, the unidimensionality and validity test was performed for both knowledge creation and organisational culture scales. The reliability and validity of the scale are associated with the unidimensionality of the scale (Anderson and Gerbing, 1991). Most importantly, a unidimensional measure fits with the data reasonably well, showing the low measurement error and measure what it intent to measure (McDonald, 1981). It quoted that "a unidimensional item or indicator has only one underlying construct that consists of unidimensional items or indicators" (Anderson and Gerbing, 1991, p.12). In addition, a typical specified measurement model is one that eliminates measurement issues that measures the relationship between a construct and its observed variables (Jöreskog, 1993; Anderson and Gerbing, 1988). In the present study, unidimensionality test is performed due to two important reasons. Firstly to examine the measurement errors and eliminate weak factor loadings and secondly to check the adequacy of the model through re-specified model and measure reliability. For this purpose, the researcher initially specified the measurement model for each construct by processing survey data (n = 131) in the statistical package IBM AMOS v19 with maximum likelihood estimation method. In the following section, an empirical and theoretical finding of unidimensionality test using a confirmatory factor analysis of both organisational culture and knowledge creation scales are summarised.

5.9.1 Unidimensionality Analysis of Knowledge Creation Scale

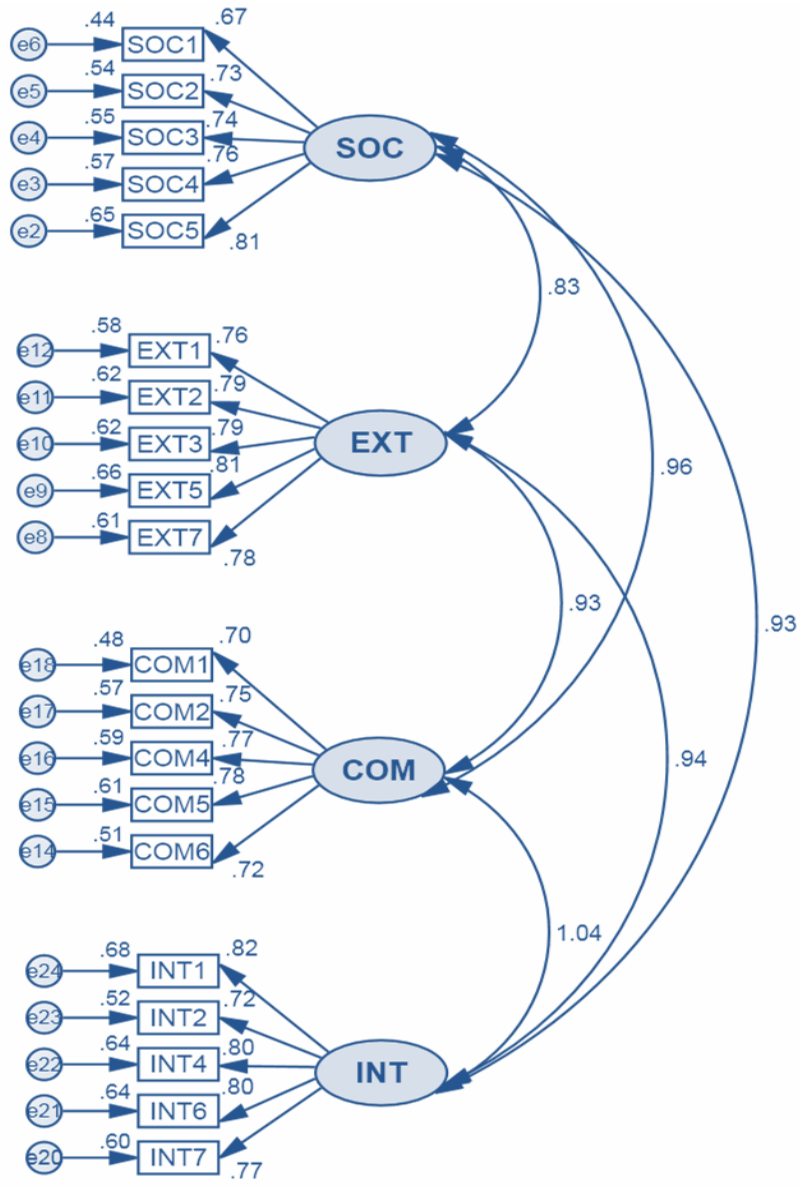
The knowledge creation measurement model includes four factors (socialisation, externalisation, combination, and internalisation). All of the four factors are measured with seven observed variables each. The unidimensionality analysis was conducted following two steps. In the first step, initial CFA run with the entire construct that includes total 60 (28 observed + 32 unobserved and 32 exogenous + 28 endogenous) variables. However, in the next step, re-specified measurement model runs only with those items that were generated in the initial model.

Table 5.10: Item Deleted in Initial CFA

Item	Low Factor Loading	Low SMC
SOC6: I like to get to know the people whom I will work with before going into a project together.	0.05	0.003
SOC7: Our team collects work-related information and ideas from (in) formal relationships with other people.	0.02	0.001
EXT4: I tend to use an analogy when expressing abstract or (theoretical) concepts.	0.06	0.003
EXT6: Our team develops new ideas through constructive dialogue by using figures and diagrams.	-0.09	0.007
COM3: After every event, I have a habit of organising and making summary of what happened.	0.05	0.003
COM7: Our team conducts experiments and shares the newly developed concepts with the entire organisation to evaluate the value of the concepts.	0.05	0.002
INT3: I will tell others what I think to make sure my understanding is the same as theirs.	0.05	0.002
INT5: Our team-members use newly learned knowledge as the sources for the next time applications.	0.11	0.013

Following to the instructions of Byrne (2010), each of the four factors are inter-correlated and observed variable regressed on its respective factor. The initial findings showed that the measurement model that includes four factors and 28 observed variables call for more re-specification to attain the model fit. For example, initial model fit estimates (i.e. $\chi 2 = 575.142$, df = 344, $\chi 2/df = 1.67$, CFI = 0.883, TLI = 0.871, IFI = 0.885, RFI = 0.731, NFI = 0.755 and RMSEA = 0.072) indicates that the initial model requires further re-specification.

Figure 5.8: AMOS Path Diagram of Re-specified First Order CFA Estimates



As a result of initial model fit results, eight items (i.e. SOC6, SOC7, EXT4, EXT6, COM3, COM7, INT3 and INT5) deleted due to low factor loadings and corresponding low squared multiple correlations. Byrne (2010) suggested that the overall model fit can be improved with the elimination of items that contain low factor loading. Therefore, six items (see Table 5.10) contained low factor loading and corresponding square multiple correlation results removed from construct for the purpose of analysis in the later stages. In the next step, re-specified measurement model runs with only those items that were generated in the initial model. Figure 5.8

shows the AMOS path diagram of re-specified CFA estimates and factor loadings. As shown, AMOS path diagram of re-specified first order CFA contains total 52 variables (20 observed + 24 unobserved).

Table 5.11: Comparative Fit Results based on Initial & Re-specified Models

Model Fit Indices	Initial Model Fit Results	Re-specified Model Fit Results	Model Fit Threshold
Absolute Fit Indices			
Chi-square	575.142	355.736	Smaller the better
Degrees of freedom	344	164	Smaller the better
Ratio of $\chi 2$ to df	1.671	2.169	≤ 2 or 3
Browne Cudeck Criterion	806.825	513.167	Smaller the better
RMSEA	0.072	0.095	> .05 but < .08 reasonable fit
Comparative Fit Indices			
Comparative Fit Index	0.883	0.901	0 > CFI > 1 for acceptance
Tucker–Lewis Index	0.871	0.885	0 > TLI > 1 for acceptance
Incremental Fit Index	0.885	0.902	≥ 0.95 for acceptance
Normed Fit Index	0.755	0.833	≥ 0.95 for acceptance
*Relative Fit Index	0.731	0.806	≥ 0.95 for acceptance
Predictive Fit Indices			
Akaike Information Criterion	755.142	487.736	Smaller the better
Expected Cross-Validation Index	5.809	3.752	Smaller the better
****Parsimonious Fit Indices**			
Parsimony-Adjusted – NFI	0.687	0.719	Closer to 1 the better
Parsimony-Adjusted – CFI	0.803	0.778	

*Similar to CFI but can be negative, therefore, CFI better choice.
** Very sensitive to model size
Source: Carmines and McIver (1981), Hu and Bentler (1999), Browne and Cudek (1993)

The model also contains 24 exogenous and 20 endogenous variables. It found that the re-specified model adequately described the sample data. More specifically, regression weights (factor loadings) of all variables load adequately against their respective factors. Since, all factor loadings between 0.67 – 0.82 and all critical ratios 7.218 – 11.010 indicated that the regression weights of all factors are statistically significant at 95 per cent confidence level. The results summarised in Table 5.11 shows the model fit results of the initial and re-specified first-order CFA. In order to examine the unidimensionality of knowledge creation scale in the context of Pakistani banks, the researcher included four model fit indices such as, absolute fit indices, comparative fit indices, predictive fit indices and parsimonious fit indices.

The results summarised in Table 5.11 shows three absolute fit indices comprised on i) Chi-Square ($\chi 2$); ii) Ratio of $\chi 2$ to df and; iii) Browne Cudeck Criterion. In the present model, chi-square value ($\chi 2 = 355.736$) of re-specified model as compared to chi-square value ($\chi 2 = 575.142$) of the initial measurement model indicates that, 44 variables (20 observed + 24 unobserved) of SECI knowledge creation scale fit very well into the data. Likewise, ratio of chi-square to degree of freedom of re-specified model also included. Harrington (2008) indicated that the chi-square value is sensitive to sample size. For that reason, ratio of chi-square to degree of freedom ($\chi 2/df$) usually used to compensate the discrepancy in the results. Since, $\chi 2/df = 2.169$ of re-specified model also indicates the statistical significance of the model at $*p < .000$. Additionally, the result of Browne Cudeck Criterion (BCC = 513.167) index also shows the adequacy of the factor structure of the knowledge creation measurement model in the context of Pakistani banking organisations.

However, in some situations, $\chi 2$ does not report precise valuation of model fit or the fit statistics may not clarify the conceptual viewpoints that could establish a hypothesis of the close fit between the model and population then an alternative fit statistic typically considered. Therefore, Root Mean Square Error of Approximation (RMSEA) included in the Table 5.11. Generally speaking, RMSEA is the most important model fit statistics that may be used as an alternative for precise valuation of model fit. According to Browne and Cudeck (1993), RMSEA value less than 0.06 or 0.08 with confidence interval means that, model offers a good fit. In the present model, results of root mean square residual (RMSEA = 0.095) also reveal the adequacy of the factor structure of the knowledge creation measurement at 95% confidence interval.

The comparative fit index results summarised in Table 5.11 indicates that the re-specified model demonstrated a good fit in all aspects and the estimated values, for example, CFI = 0.901, TLI = 0.885, IFI = 0.90, NFI = 0.833 and RFI = 0.806 hanged behind the threshold limit. Hence, this result is implying the unidimensionality of the factor structure.

5.9.2 Unidimensionality Analysis of Organisational Culture Scale

Like knowledge creation scale, unidimensionality analysis of the organisational culture scale is performed in two steps. In the first step, initial first-order CFA run with the each organisational culture index. While in the next step, re-specified measurement model runs only with those items that were generated in the initial model. The OC scale includes four factors i.e. involvement (INV), consistency (CON), adaptability (ADA) and mission (MIS). As shown, involvement culture measured with 3 indexes: empowerment (EMP), team orientation (TON) and capability development (CDT), consistency measured with 3 indexes: core values (CVS), agreement (AGT) and coordination & integration (CIN), adaptability measured with 3 indexes: organisational (OCH), customer focus (CFS) and organisational learning (OLG) and mission measured with 3 indexes: strategic direction & intent (SDI), goal & objective (GOB) and vision (VIS). Each of the indexes measured with five observed variables. It means that, each of the factors measured with fifteen observed variables.

Table 5.12: Item Deleted in Initial First-Order CFA

Item	Low Factor Loading	Low SMC
EMP5: Work planning is ongoing and our manager involves everyone in the process to some degree	0.050	0.003
TON4: Teams are our primary building blocks	-0.031	0.001
CDT5: Problems often arise because we do not have the necessary skills to do our routine work	0.020	0.0001

The initial findings showed that the measurement model that includes three involvement culture indexes and 15 observed variables call for more re-specification to attain the model fit. For example, initial model fit estimates (i.e. $\chi 2 = 140.713$, df = 51, $\chi 2/df = 2.759$, CFI = 0.905, TLI = 0.877, IFI = 0.906, RFI = 0.819, NFI = 0.860 and RMSEA = 0.115) indicates that the initial model requires further re-specification. As a result of these findings, three items (EMP4, TON4, CDT5) deleted due to low factor loadings and corresponding low squared multiple correlations. Byrne (2010) suggested that the overall model fit can be improved with the elimination of items that contain low factor loading. Therefore, three items (see Table 5.12) contained low factor loading and corresponding square multiple correlation results removed from construct for the purpose of analysis in the later

stages. In the next step, re-specified measurement model runs with only those items that were generated in the initial model.

Figure 5.9: AMOS Path Diagram of Initial & Re-specified Factor Loadings

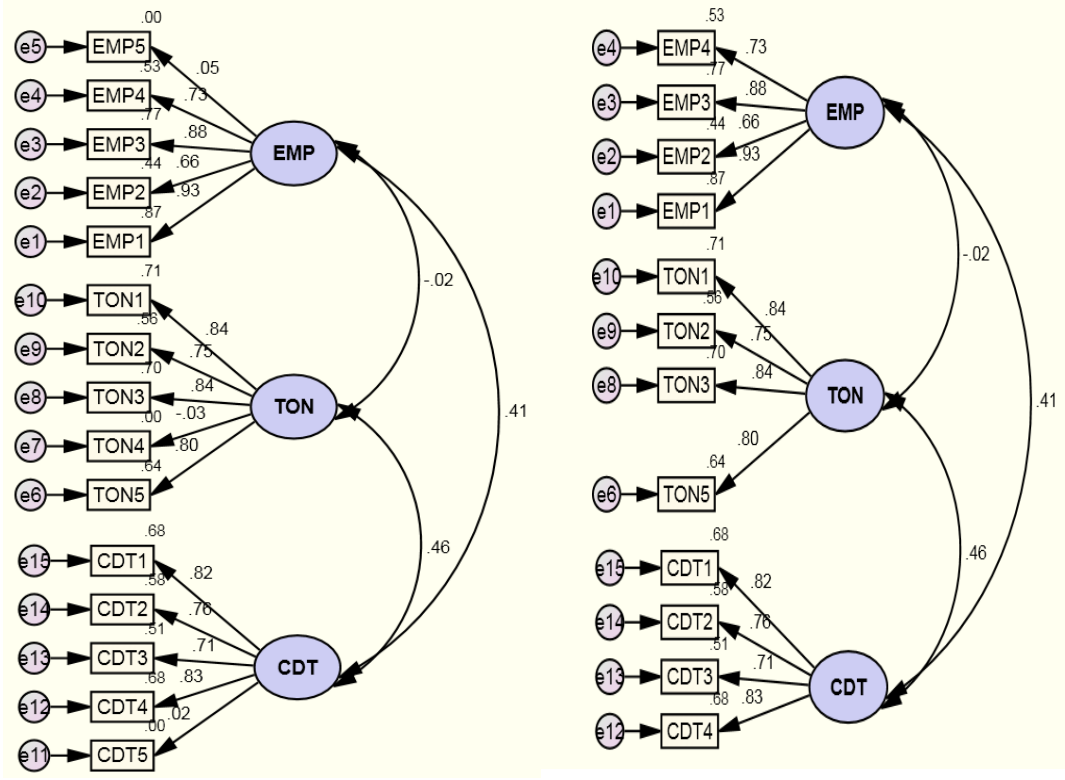


Figure 5.9 shows the AMOS path diagram of both initial and re-specified first-order CFA estimates and factor loadings. As shown, AMOS path diagram of re-specified first order CFA contains total 27 (12 observed + 15 unobserved) variables. It found that the re-specified model adequately described the sample data. More specifically, regression weights (factor loadings) of the all variables load adequately against their respective factors. Since, all factor loadings between 0.66 – 0.93 and all critical ratios 7.44 – 11.08 indicated that the regression weights of all factors are statistically significant at 95 per cent confidence level. The results summarised in the Table 5.13 shows the model fit results of both initial and re-specified CFA. In order to examine the unidimensionality of the involvement culture in the Pakistani banking organisations, we have included four model fit indices along with corresponding sub-indices. For example, in the case of involvement culture construct, chi-square value ($\chi 2 = 140.713$) of re-specified model as compared to chi-square value ($\chi 2 = 183.757$)

of the initial measurement model indicates that, the involvement culture construct fit very well into the data.

Table 5.13: Comparative Fit Results based on Initial & Re-specified Models			
Model Fit Indices	**Initial Model Fit Results**	**Re-specified Model Fit Results**	**Model Fit Threshold**
Involvement Culture			
Absolute Fit Indices			
Chi-square	183.757	140.713	Smaller the better
Degrees of freedom	87	51	Smaller the better
$\chi 2$ /df	2.11	2.75	≤ 2 or 3
BCC	292.999	227.234	Smaller the better
RMSEA	0.092	0.011	>.05 but < .08 reasonable fit
Comparative Fit Indices			
CFI	0.898	0.905	0 > CFI > 1 for acceptance
TLI	0.876	0.877	0 > TLI > 1 for acceptance
IFI	0.899	0.906	≥ 0.95 for acceptance
NFI	0.825	0.860	≥ 0.95 for acceptance
*RFI	0.789	0.819	≥ 0.95 for acceptance
Predictive Fit Indices			
AIC	279.757	218.713	Smaller the better
ECVI	2.119	1.657	Smaller the better
****Parsimonious Fit Indices**			
Parsimony-Adjusted – NFI	0.684	0.665	Closer to 1 the better
Parsimony-Adjusted – CFI	0.744	0.699	

*Similar to CFI but can be negative, therefore, CFI better choice.
** Very sensitive to model size
Source: Carmines and McIver (1981), Hu and Bentler (1999), Browne and Cudek (1993)

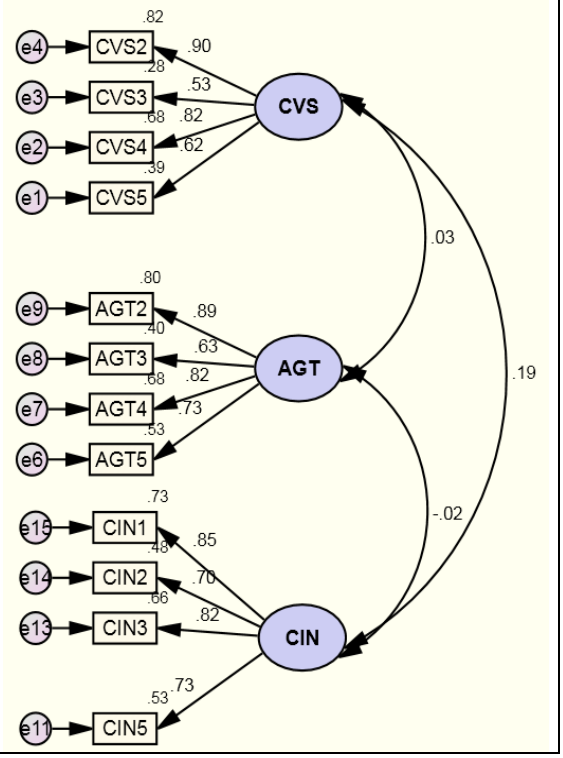
Table 5.14: Item Deleted in Initial First-Order CFA		
Item	**Low Factor Loading**	**Low SMC**
CVS1: The senior management of bank "practice what they preach"	0.185	0.034
AGT1: When disagreements occur, we work hard to achieve "win-win" solutions	0.138	0.019
CIN4: Working with someone from another part of this bank is like working with someone from a different bank	0.013	0.000
OCH1: The way things are done is very flexible and easy to change	0.014	0.000
CFS2: Customer input directly influences our decisions.	0.142	0.020
OLG2: Innovation and risk taking are encouraged and rewarded by management	-0.054	0.003
SDI5: Our strategic direction is unclear to me	-0.112	0.013
GOB4: Management continuously monitor our progress against our stated goals	-0.074	0.005
VIS3: Short-term thinking often compromises our long-term vision	0.015	0.000

Alternatively, $\chi 2/df = 51$ of re-specified model as compared to $\chi 2/df = 87$ of initial model also indicates the statistical significance of the model at *p < .000. Additionally, the result of Browne Cudeck Criterion (BCC = 227.234) index also shows the adequacy of the factor structure of the knowledge creation measurement model in the context of Pakistani banking organisations.

Figure 5.10: AMOS Path Diagram of Re-specified Model of Consistency Culture

Initial Model Fit
Chi-square = 135.728
Degrees of freedom = 87
$\chi 2$ / df = 1.560
CFI = 0.932
TLI = 0.918
IFI = 0.933
RFI = 0.800
NFI = 0.834
RMSEA = 0.065

Re-specified Model Fit
Chi-square = 95.483
Degrees of freedom = 51
$\chi 2$ / df = 1.87
CFI = 0.937
TLI = 0.919
IFI = 0.938
RFI = 0.840
NFI = 0.876
RMSEA = 0.081



However, in some situations, $\chi 2$ does not report precise valuation of model fit or the fit statistics may not clarify the conceptual viewpoints that could establish a hypothesis of the close fit between the model and population then an alternative fit statistic typically considered. Therefore, Root Mean Square Error of Approximation (RMSEA) included in the Table 5.14. In the present model, results of root mean square residual (RMSEA = 0.011) also reveals the adequacy of the factor structure of the involvement at 95% confidence interval. In addition, Table 5.13 also illustrates five comparative fit indices. According to Byrne (1994), the CFI value 0.90 or more is evidence of unidimensionality. As shown, comparative fit indices of re-specified model demonstrated a good fit in all aspects and the estimated values, for example, CFI = 0.905, TLI = 0.877, IFI = 0.906, NFI = 0.860 and RFI = 0.891 hanged behind

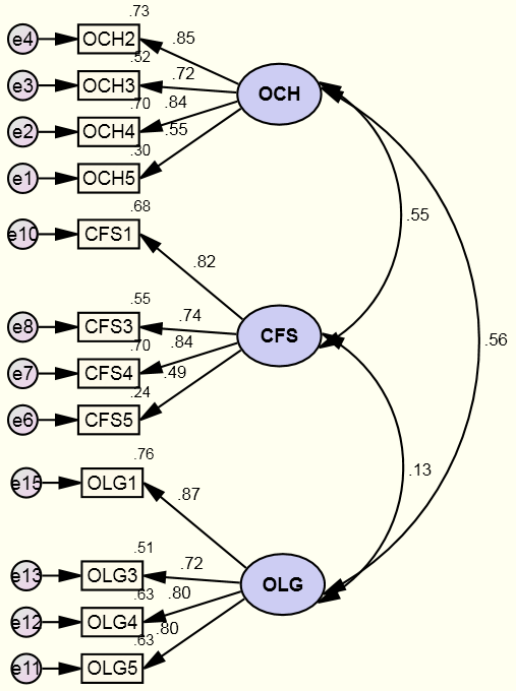
the threshold limit. Hence, this result is implying the unidimensionality of the factor structure.

Like involvement culture construct, the both initial CFA and re-specified measurement model runs with consistency, adaptability and mission culture factors. Each of the construct measured with three indexes and each of the indexes measured with five observed variables. It means that, each of the construct measured with fifteen observed variables. As a result of initial CFA, six more items (three items per index) deleted (as shown in Table 5.14) from these three constructs. Whereas, total thirty six items retained for model re-specification in the next step and hypothesis testing, in the later stages. Figure 5.10, 5.11 and 5.12 shows the AMOS path diagram of re-specified first-order CFA estimates and factor loadings results of consistency, adaptability and mission culture constructs.

Figure 5.11: AMOS Path Diagram of Re-specified Model of Adaptability Culture

Initial Model Fit Result
Chi-square = 145.712
Degrees of freedom = 87
$\chi 2$ / df = 1.674
CFI = 0.925
TLI = 0.909
IFI = 0.926
RFI = 0.80
NFI = 0.835
RMSEA = 0.072

Re-specified Model Fit Result
Chi-square = 114.456
Degrees of freedom = 51
$\chi 2$ / df = 2.24
CFI = 0.919
TLI = 0.895
IFI = 0.921
RFI = 0.826
NFI = 0.866
RMSEA = 0.097



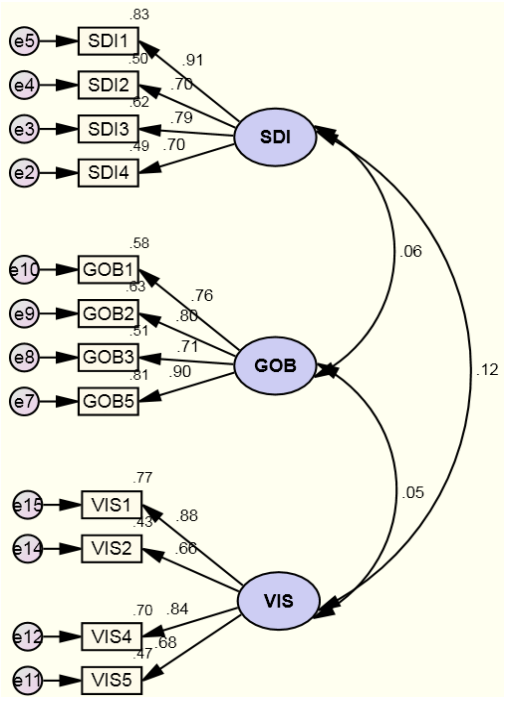
In order to examine the unidimensionality of these three organisational culture indexes we have included the model fit results of at the left hand side of the figure 5.10, 5.11, and 5.12. For example, Figure 5.10 indicates the consistency culture model fit results. In the case of consistency culture construct, chi-square value ($\chi 2$ =

95.483) of re-specified model as compared to chi-square value ($\chi 2$ = 135.728) of the initial measurement model indicates that the re-specified model fit with the data very well after modifications in terms of removal of the low factor loadings and SMC values from the model.

Figure 5.12: AMOS Path Diagram of Re-specified Model of Mission Culture

Initial Model Fit
Chi-square = 213.771
Degrees of freedom = 87
$\chi 2$ / df = 2.45
CFI = 0.851
TLI = 0.820
IFI = 0.854
RFI = 0.730
NFI = 0.776
RMSEA = 0.105

Re-specified Model Fit
Chi-square = 162.317
Degrees of freedom = 79
$\chi 2$ / df = 2.05
CFI = 0.867
TLI = 0.828
IFI = 0.869
RFI = 0.767
NFI = 0.820
RMSEA = 0.0129



5.10 Validity of the Scale in the Post-Hoc Scale Validation Phase

In a post-hoc scale validation phase, the CFA measurement model was processed to test the relationship between the latent construct and measure the convergent and discriminant validity. The measurement model in the CFA used to assess the validity of the measures i.e. convergent and discriminant (Farrell and Rudd, 2009). For example, Farrell and Rudd (2009, p.19) quoted that "if a factor analysis is misinterpreted, and discriminant validity is not established, then measurement scales used in research may not function correctly, and conclusions made regarding relationships between constructs under investigation may be incorrect". Therefore, in case of this study, the validity of the scales measured using CFA method that primarily comprises on two steps: i) application of CFA measurement model and; ii) assessment of convergent and discriminant validity. The CFA measurement model is normally used when a solid theoretical foundation of the latent variable structure is available (Byrne, 2003). The purpose behind such measurement model is to test the

validity of the selected variables through the adequacy of the hypothesised factor structure (Byrne, 2005).

In addition, structural model should be based on a certain hypotheses (or priori theory). Therefore, based on the knowledge (or priori), a relationship between the observed variables and the underlying latent factors has been drawn that leads for hypothesis testing statistically. In the case of this study, the SECI knowledge creation theory gives conceptual backings for the underlying latent variable structure. Similarly, Denison's organisational culture scale has been employed to describe the culture of Pakistani banking organisations. Nevertheless, lack of empirically validated scales for measuring intense relationship alike organisational culture and knowledge creation in Pakistani banking organisational context may also create certain validity issues (Song et al., 2011, Thompson, 2004 and DeVellis, 2003). For that reason, before hypothesis testing H_1, H_2, H_3... H_{10} in the later stages, separate CFAs for both organisational culture and knowledge creation were carried out. In this connection, following two research hypotheses H_0 (a) and H_0 (b) were developed.

H_0(a): Knowledge creation scale developed for this study can be employed to enhance the insights of Pakistani banking organisations into their knowledge creation and the process involved in it.

H_0(b): Organisational culture scale developed for this study can be employed to describe the culture of Pakistani banking organisations.

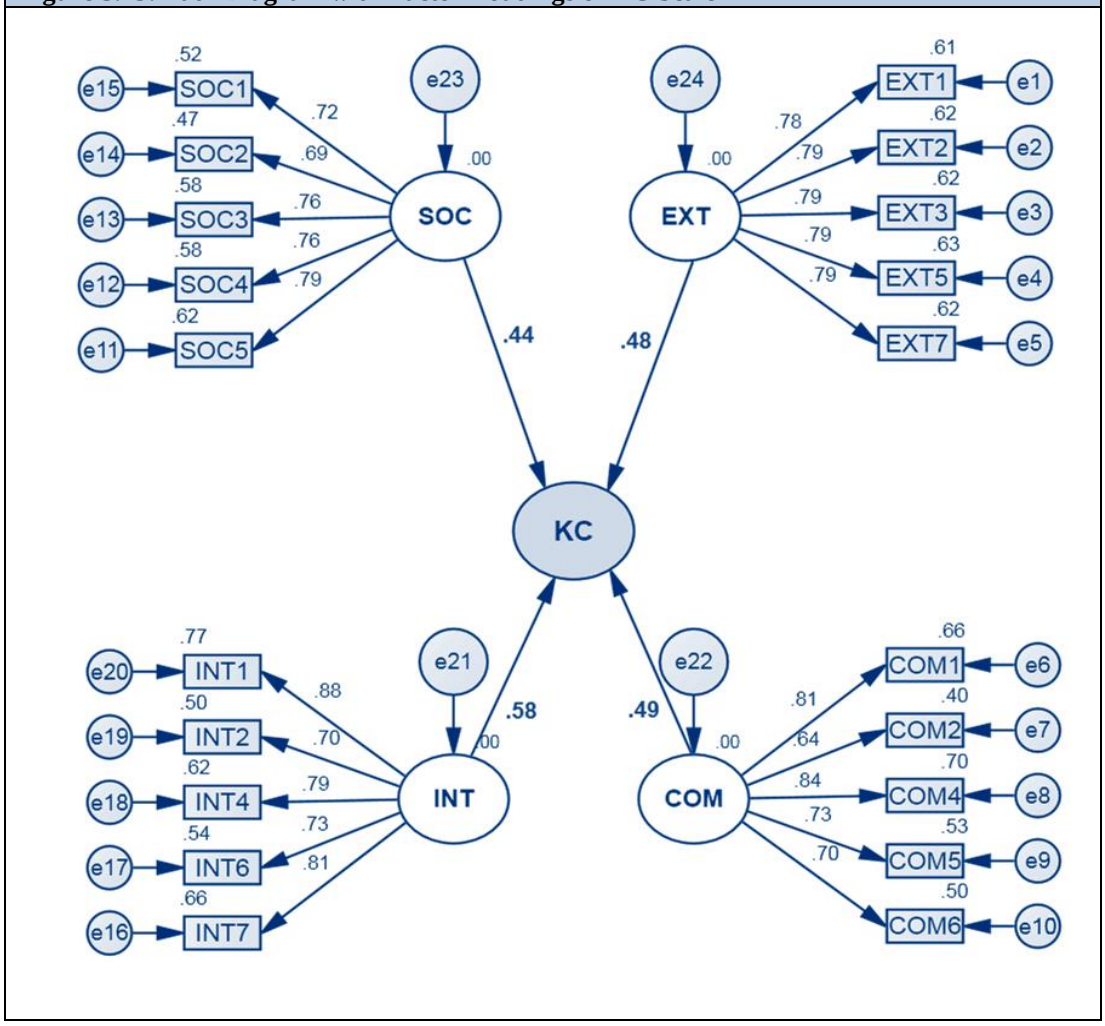
In the following, result and analysis of the measurement models of both KC and OC scales along with the convergent and discriminate validity results are summarised.

5.10.1 Validity of Knowledge Creation Scale

The factor indicators of the first-order factors SOC, EXT, COM and INT are continuous and indicates the relationship between the latent construct in the model. The first-order factors are indicators of the second-order factor KC. The underlying

purpose of the CFA model with a second-order factor (see Figure 5.13) is to facilitate hypothesis testing H_0 (a) and to measure the convergent and discriminate validity. In this model, SOC is measured by SOC1, SOC2, SOC3, SOC4 and SOC5; EXT is measured by EXT1, EXT2, EXT3, EXT5 and EXT7; COM is measured by COM1, COM2, COM4, COM5 and COM6 and INT is measured by INT1, INT2, INT4, INT6 and INT7. However, the second-order factor KC is measured by SOC, EXT, COM and INT.

Figure 5.13: Path Diagram with Factor Loadings of KC Scale



The results presented in the Table 5.15 shows the knowledge creation measurement model. For example, the model fit result of the chi-square ($\chi 2 = 490.414$) indicates that 44 variables (20 observed + 24 unobserved) of SECI knowledge creation construct fit the data reasonably well. The ratio of chi-square to degree of freedom ($\chi 2/df = 490.414/170 = 2.88$) indicate that the second order CFA model is

statistically significant at p < .000. Alternatively, the results of other absolute fit indices, for example, BCC = 985.827, BIC = 108.422, CAIC = 1125.422 and RMR = 0.482 also provided a marginally acceptable fit for the knowledge creation measurement model.

Table 5.15: Model Fit Results of Second Order CFA Model

Model Fit Indices	Second Order CFA Model Fit Results	Model Fit Threshold Limit
Absolute Fit Indices		
Chi-square	490.414	Smaller the better
Ratio of $\chi 2$ to df	2.88	≤ 2 or 3
Browne Cudeck Criterion	985.827	Smaller the better
Bayes Information Criterion	1085.422	Smaller the better
Consistent AIC	1125.422	Smaller the better
Root Mean Residual – RMR	0.482	0 indicates perfect fit
Comparative Fit Indices		
Normed Fit Index	0.881	≥ 0.95 for acceptance
Incremental Fit Index	0.932	≥ 0.95 for acceptance
Tucker–Lewis Index	0.984	0 > TLI > 1 for acceptance
Comparative Fit Index	0.928	0 > CFI > 1 for acceptance
[a] Relative Non-Centrality Fit Index	0.832	≥ 0.95 for acceptance
Predictive Fit Indices		
Akaike Information Criterion	970.414	Smaller the better
Expected Cross-Validation Index	7.465	Smaller the better
Parsimonious Fit Indices		
Parsimony-Adjusted – NFI	0.520	Very sensitive to model size
Parsimony-Adjusted – CFI	0.562	Very sensitive to model size
Alternative Fit Indices		
Goodness of Fit Index	0.621	≥ 0.95 not generally recommended
Adjusted GFI	0.532	≥ 0.95 Performances poor in simulation studies
Root Mean Square Error of Approximation – RMSEA	0.080	≤ 0.06 to 0.08 with confidence interval

Source: Carmines and McIver (1981), Hu and Bentler (1999), Browne and Cudek (1993)
[a] Similar to CFI but can be negative, therefore, CFI better choice

The comparative fit statistics of second-order CFA demonstrated a good fit in all aspects. All the estimated values, for example, NFI = 0.881, IFI = 0.932, TLI = 0.984, CFI = 0.928 and RFI = 0.832 hanged behind the threshold limit. Beside other results, three parsimony correction statistics, for example, PNFI = 0.520 and PCFI = 0.562 also demonstrated a good fit to the data. Another, two predictive fit indices results i.e. AIC = 970.414 and ECVI = 7.465 also demonstrated a much better fit according to the benchmark limit. In case of three alternative fit result, GFI = 0.621, AGFI = 0.532 and RMSEA = 0.080 also indicated that the hypothesised model fits

the data well at 90% confidence interval. In general, model fit results of second-order CFA model provide a reasonable fit to the data in this study.

Table 5.16: Factor Loadings, AVE, CR and DV Analysis

Items	[a] Std Regression Weight (Factor Loadings)	[b] R^2 / SMC Item Reliabilities	[c] Measurement Error (δ)	[d] AVE (%)	[e] CR	[f] DV
Socialisation						
SOC1	.720	$.720^2 = .518$	1 - .518 = .482			
SCO2	.688	$.688^2 = .473$	1 - .473 = .527			0.557
SOC3	.763	$.763^2 = .582$	1 - .582 = .418	55.5	0.77	>
SOC4	.763	$.763^2 = .582$	1 - .582 = .418			0.366
SOC5	.786	$.786^2 = .618$	1 - .618 = .382			
Externalisation						
EXT1	.784	$.784^2 = .614$	1 - .614 = .386			
EXT2	.790	$.790^2 = .624$	1 - .624 = .376			0.620
EXT3	.786	$.786^2 = .617$	1 - .617 = .383	62.0	0.83	>
EXT5	.792	$.792^2 = .627$	1 - .627 = .373			0.366
EXT7	.786	$.786^2 = .617$	1 - .617 = .383			
Combination						
COM1	.811	$.811^2 = .658$	1 - .658 = .342			
COM2	.635	$.635^2 = .403$	1 - .403 = .597			0.557
COM4	.836	$.836^2 = .699$	1 - .699 = .301	55.7	0.77	>
COM5	.726	$.726^2 = .527$	1 - .527 = .473			0.481
COM6	.704	$.704^2 = .496$	1 - .496 = .504			
Internalisation						
INT1	.877	$.877^2 = .769$	1 - .769 = .231			
INT2	.704	$.704^2 = .496$	1 - .496 = .504			0.616
INT4	.785	$.785^2 = .616$	1 - .616 = .384	61.6	0.83	>
INT6	.733	$.733^2 = .537$	1 - .537 = .463			0.481
INT7	.815	$.815^2 = .664$	1 - .664 = .336			

AVE (SOC) = .518 + .473 + .582 + .582 + .618 = 3.21 = 2.774 / 5 = 55.5%
AVE (EXT) = .615 + .624 + .618 + .627 + .618 = 3.52 = 3.102 / 5 = 62.0%
AVE (COM) = .658 + .403 + .699 + .527 + .496 = 3.27 = 2.783 / 5 = 55.7%
AVE (INT) = .769 + .496 + .616 + .537 + .664 = 3.06 = 3.082 / 5 = 61.6%

CR (SOC) = $(.51 + .47 + .58 + .58 + .61)^2 / [(.51 + .47 + .58 + .58 + .61)^2 + (.48 + .52 + .41 + .41 + .38)] = 2.77^2 / 2.77^2 + 2.22 = 0.77$

CR (EXT) = $(.61 + .62 + .61 + .62 + .61)^2 / [(.61 + .62 + .61 + .62 + .61)^2 + (.38 + .37 + .38 + .37 + 38)] = 3.10^2 / 3.10^2 + 1.89 = 0.83$

CR (COM) = $(.65 + .40 + .69 + .52 + .49)^2 / [(.65 + .40 + .69 + .52 + .49)^2 + (.34 + .59 + .30 + .47 + .50)] = 2.78^2 / 2.78^2 + 2.2 = 0.77$

CR (INT) = $(.76 + .49 + .61 + .53 + .66)^2 / [(.76 + .49 + .61 + .53 + .66)^2 + (.23 + .50 + .38 + .46 + .33)] = 3.08^2 / 3.08^2 + 1.91 = 0.83$

[a] Standard regression weights (factor loading) for component factors (i.e., socialisation, externalisation, combination and internalisation).

[b] Item reliabilities are the squared value of each of the factor loadings, e.g., item reliability of SOC1 = $.720^2 = .518$

[c] The measurement error (symbolically **δ)** is also referred to as the standardized error variance. Here, delta is calculated as 1 minus the squared factor loading (or item reliability), e.g., the SOC1 delta is 1

– .518 = .482

[d] AVE measures the average amount of variation that a latent construct can explain in the observed variables to which it is theoretically related.

[e] Composite Reliability (CR) can be computed by squaring the sum of factor loading divided by the sum of factor loadings plus sum of standardised error variance (the sum of the variance due to random measurement error for each loading.

[f] Discriminant Validity (DV) is supported if variance extracted estimates greater than the squared correlation.

In other words, all the model fit values presented in the Table 5.15 supported the usefulness of the four domains of the knowledge creation theory and items are reflecting the knowledge creation process in the Pakistani banking organisations. For example, the standardised estimates of this model can be used to evaluate the 'relative contribution of the each predictor variable' (Arbuckle, 1995, p.44). Following to suggested threshold limit of Kline (2011) the path coefficients ≥ 0.10 represent a small effect, path coefficients ≥ 0.30 represent a medium effect, and path coefficients ≥ 0.50 represent a large effect; the path coefficients of the 20 items and four knowledge creation domains of knowledge creation scale confirmed that the measurement model adequately described the sample data in the Pakistani banking organisations.

For measuring convergent validity of the construct, the researcher utilised the frequently used method typically known as the average variance extracted (AVE). The AVE measures the 'degree of variance' in the indicators accounted for by the latent construct (Hair et al., 2010). According to Fornell and Larcker (1981), the AVE is a more conservative test of convergent validity as it measures the degree of variance determined by the construct relative to the degree of variance determined by the measurement error. AVE can be judged to be adequate when measured value equals or exceeds 0.50. As shown in Table 5.16, the AVE value for SOC is 0.555. It means that the 55.5% of the variance is explained by the SOC construct, and 44.5% due to measurement error. According to Fornell and Larcker (1981), constructs should exhibit estimates of .50 or greater. In case of four dimensions of knowledge creation scale, the AVE values (i.e. SOC = 0.555, EXT = 0.620, COM = 0.557 and INT = 0.616) demonstrates an acceptable fit according to the benchmark limit. It

validates that the variance captured by the factor is greater than the variance due to measurement error. Thus, variance extracted estimates meet this minimum threshold, so the validity of the latent constructs, as well as the associated constructs, is acceptable. Table 5.16 also contains the composite reliability (CR) results of the four latent factors included in the model. It found that, all the CR values meet that minimum acceptable level of 0.60 as suggested by Fornell and Larcker (1981). In order to assess the discriminant validity, AVE values were utilised. Fornell and Larcker (1981) indicated that, discriminant validity can support the construct when AVE estimates greater than the square of the inter-factor correlation. For instance, the correlation between SOC and EXT is 0.605 and the squared correlation (i.e. 0.605^2) is 0.366. In the case of knowledge creation construct, AVE for SOC and EXT is 0.557 and 0.620 respectively. Since, both values 0.557 > 0.366 and 0.620 > 0.366 supported discriminant validity within the model.

5.10.2 Validity of Organisational Culture Scale

Like knowledge creation scale, the measurement model of the organisational culture scale was performed using IBM AMOS v19. The purpose of the CFA model is to facilitate hypothesis testing H_0 (b) and to measure the construct reliability and validity. As shown in Figures 5.14, 5.15, 5.16, and 5.17, the independent model which assumes that all variables are uncorrelated and shows the relationship between the latent constructs in the model. For example, INV is measured with 3 indexes (i.e. EMP, TON and CDT), CON is measured with 3 indexes (i.e. CCE, CFS and OLG), ADA is measured with 3 indexes (i.e. CVS, AGT, CIN) and MIS are measured with three indexes (i.e. SDI, GOB and VIS).

As shown, the model fit results indicate the strength of the hypothesised relationships among the construct. For example, chi-square values of the INV, CON, ADA, and MIS culture ($\chi 2$ = 200.951, 168.205, 167.760 and 222.430) indicates that, 129 variables (60 observed + 69 unobserved) of organisational culture construct fit the data reasonably well. The ratio of chi-square to degree of freedom of each culture dimension ($\chi 2/df$ = 3.721, 3.11, 3.10, and 4.11) also demonstrates that the CFA measurement model is statistically significant at $p < .000$.

Figure 5.14: Path Diagram, Factor Loadings and Model Fit Results of INV Culture

INVOLVEMENT (INV) CULTURE

Absolute Fit Indices
Chi-square = 200.951
df = 54
$\chi 2$ / df = 3.721
Browne Cudeck Criterion = 280.951
RMSEA = 0.145

Comparative Fit Indices
Normed Fit Index = 0.857
Incremental Fit Index = 0.891
Tucker–Lewis Index = 0.865
Comparative Fit Index = 0.890
[a] Relative Non-Centrality Fit Index = 0.825

Predictive Fit Indices
Akaike Information Criterion = 272.951
Expected Cross-Validation Index = 2.100

Parsimonious Fit Indices
Parsimony-Adjusted – NFI = 0.701
Parsimony-Adjusted – CFI = 0.728

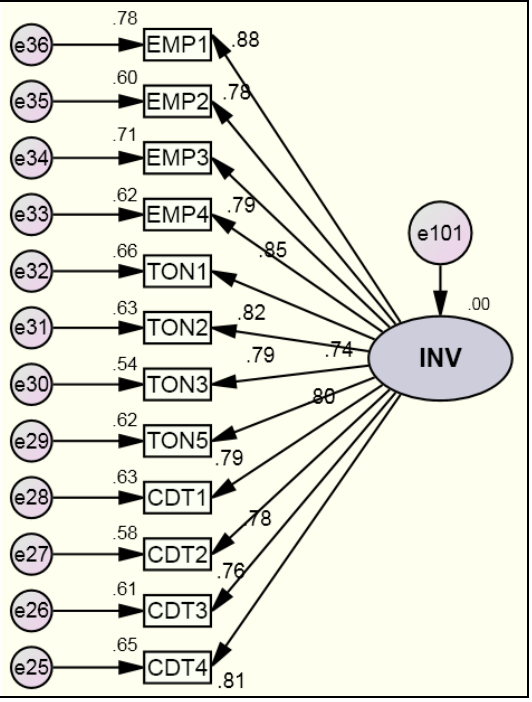


Figure 5.15: Path Diagram with Second-Order Factor Loadings & Model Fit Results

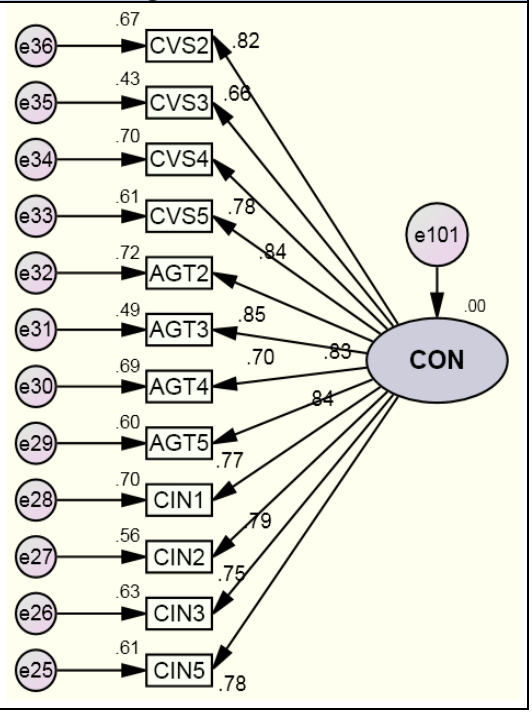
CONSISTENCY (CON) CULTURE

Absolute Fit Indices
Chi-square = 168.205
df = 54
$\chi 2$ to df = 3.11
Browne Cudeck Criterion = 248.205
RMSEA = 0.028

Comparative Fit Indices
Normed Fit Index = 0.870
Incremental Fit Index = 0.909
Tucker–Lewis Index = 0.887
Comparative Fit Index = 0.908
[a] Relative Non-Centrality Fit Index = 0.842

Predictive Fit Indices
Akaike Information Criterion = 240.205
Expected Cross-Validation Index = 1.848

Parsimonious Fit Indices
Parsimony-Adjusted – NFI = 0.713
Parsimony-Adjusted – CFI = 0.743



Beside this, the results of other absolute fit indices, for example, BCC (280.951, 248.205, 247.760 and 302.430) and RMSEA (0.145, 0.028, 0.027 and 0.015) also indicates the hypothesised model fits the data well at 90% confidence interval. The

other comparative fit statistics of the measurement model also demonstrates a good fit in all aspects. All the estimated values, for example, NFI, IFI, TLI, CFI and RFI hanged behind the threshold limit. In general, model fit results of the measurement model of the four culture dimensions (i.e. INV, CON, ADA and MIS) provide a reasonable fit to the data in this study. Moreover, all the estimated values supported the hypothesis H_1 (b) which states that the organisational culture scale developed for this study represent the culture of Pakistani banking organisations. The reliability and validity is estimated by calculating composite reliability and average variance extracted (AVE). The results in Table 5.17 shows the standardised regression weights (factor loadings), average variance extracted (AVE), composite reliability (CR), and discriminant validity (DV) estimates.

Figure 5.16: Path Diagram with Second-Order Factor Loadings & Model Fit Results

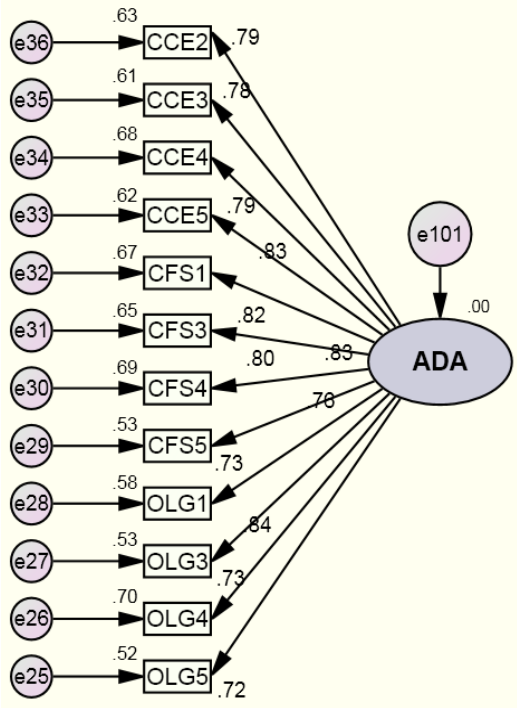
ADAPTABILITY (ADA) CULTURE

Absolute Fit Indices
Chi-square = 167.760
df = 54
$\chi 2$ / df = 3.106
Browne Cudeck Criterion = 247.760
RMSEA = 0.027

Comparative Fit Indices
Normed Fit Index = 0.870
Incremental Fit Index = 0.908
Tucker–Lewis Index = 0.887
Comparative Fit Index = 0.907
[a] Relative Non-Centrality Fit Index = 0.841

Predictive Fit Indices
Akaike Information Criterion = 239.760
Expected Cross-Validation Index = 1.844

Parsimonious Fit Indices
Parsimony-Adjusted – NFI = 0.712
Parsimony-Adjusted – CFI = 0.742



In the case of organisational culture scale, the AVE value for INV is 0.638. It means that the 63.8% of the variance is explained by the INV construct and 36.2% is due to measurement error. In case of other three organisational culture dimensions, the AVE values (i.e. CON = 0.618, ADA = 0.618 and MIS = 0.595) indicate an acceptable evidence of convergent validity of the latent construct. It validates that the variance captured by the factor is larger than the variance due to measurement error. The CR column shows the composite reliability values of the four latent factors included in

the model. It found that, all the CR values meet that minimum acceptable level of 0.60 as suggested by Fornell and Larcker (1981). However, the last column DV indicates the discriminant validity results based on Fornell and Larker's (1981) criterion. Fornell and Larcker (1981) indicated that, discriminant validity can support the construct when AVE estimates greater than the square of the inter-factor correlation. For instance, the correlation between INV and CON is 0.522 and the squared correlation (i.e. 0.522^2) is 0.272. Whereas; AVE values for the INV and CON are 0.595 and 0.504 respectively. Since, both values 0.595 > 0.272 and 0.504 > 0.272 supported discriminant validity within the model.

Figure 5.17: Path Diagram with Second-Order Factor Loadings & Model Fit Results

MISSION (MIS) CULTURE

Absolute Fit Indices
Chi-square = 222.430
df = 54
$\chi 2$ / df = 4.11
Browne Cudeck Criterion = 302.430
RMSEA = 0.015

Comparative Fit Indices
Normed Fit Index = 0.824
Incremental Fit Index = 0.861
Tucker–Lewis Index = 0.828
Comparative Fit Index = 0.859
[a] Relative Non-Centrality Fit Index = 0.785

Predictive Fit Indices
Akaike Information Criterion = 294.430
Expected Cross-Validation Index = 2.265

Parsimonious Fit Indices
Parsimony-Adjusted – NFI = 0.674
Parsimony-Adjusted – CFI = 0.703

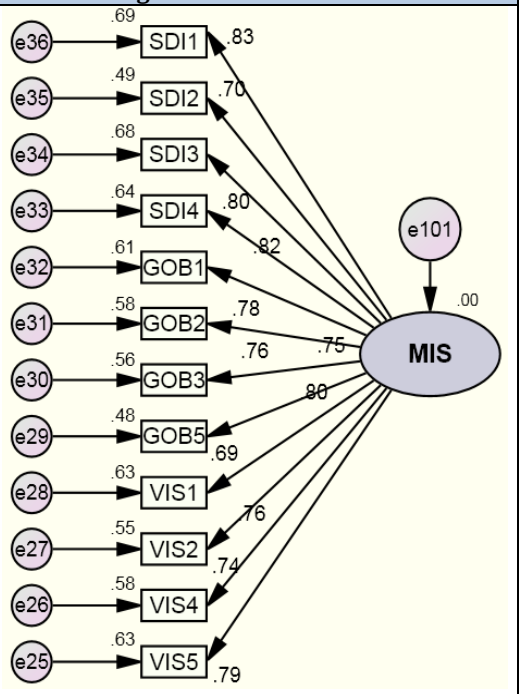


Table 5.17: Factor Loadings, AVE, CR and DV Analysis						
Items	**[a] Std Regression Weight (Factor Loadings)**	**[b] R^2 / SMC Item Reliabilities**	**[c] Measurement Error (δ)**	**[d] AVE (%)**	**[e] CR**	**[f] DV**
Involvement: EMP = Empowerment, TON = Team Orientation, CDT = Capability Development						
EMP1	.883	$.883^2 = .780$	1 - .780 = .220			
EMP2	.776	$.776^2 = .602$	1 - .602 = .398			
EMP3	.845	$.845^2 = .714$	1 - .714 = .286			
EMP4	.789	$.789^2 = .623$	1 - .623 = .377			
TON1	.815	$.815^2 = .664$	1 - .664 = .336			
TON2	.794	$.794^2 = .630$	1 - .630 = .370			0.638
TON3	.736	$.736^2 = .542$	1 - .542 = .458	63.8	0.931	>
TON5	.786	$.786^2 = .618$	1 - .618 = .382			0.272
CDT1	.796	$.796^2 = .634$	1 - .634 = .366			
CDT2	.763	$.763^2 = .582$	1 - .582 = .418			
CDT3	.784	$.784^2 = .615$	1 - .615 = .385			
CDT4	.808	$.808^2 = .653$	1 - .653 = .347			
Consistency: CVS = Core Values, AGT = Agreement and CIN = Coordination & Integration						
CVS2	.817	$.817^2 = .667$	1 - .667 = .333			
CVS3	.655	$.655^2 = .429$	1 - .429 = .571			
CVS4	.838	$.838^2 = .702$	1 - .702 = .298			
CVS5	.782	$.782^2 = .612$	1 - .612 = .388			
AGT2	.851	$.851^2 = .724$	1 - .724 = .276			
AGT3	.700	$.700^2 = .490$	1 - .490 = .510			0.618
AGT4	.833	$.833^2 = .694$	1 - .694 = .306	61.8	0.923	>
AGT5	.773	$.773^2 = .598$	1 - .598 = .402			0.272
CIN1	.836	$.836^2 = .699$	1 - .699 = .301			
CIN2	.747	$.747^2 = .558$	1 - .558 = .442			
CIN3	.791	$.791^2 = .626$	1 - .626 = .374			
CIN5	.782	$.782^2 = .612$	1 - .612 = .388			
Adaptability: OCH = Organisational Change, CFS = Customer Focus, OLG = Organisational Learning						
OCH2	.792	$.792^2 = .627$	1 - .627 = .373			
OCH3	.781	$.781^2 = .610$	1 - .610 = .390			
OCH4	.826	$.826^2 = .682$	1 - .682 = .318			
OCH5	.790	$.790^2 = .624$	1 - .624 = .376			
CFS1	.818	$.818^2 = .669$	1 - .669 = .331			
CFS3	.804	$.804^2 = .646$	1 - .646 = .354			0.618
CFS4	.832	$.832^2 = .692$	1 - .692 = .308	61.8	0.923	>
CFS5	.729	$.729^2 = .531$	1 - .531 = .469			0.591
OLG1	.764	$.764^2 = .584$	1 - .584 = .416			
OLG3	.729	$.729^2 = .531$	1 - .531 = .469			
OLG4	.836	$.836^2 = .699$	1 - .699 = .301			
OLG5	.721	$.721^2 = .520$	1 - .520 = .480			
Mission: SDI = Strategic Direction, GOB = Goals & Objectives, VIS = Vision						
SDI1	.830	$.830^2 = .689$	1 - .689 = .311			
SDI2	.700	$.700^2 = .490$	1 - .490 = .510			
SDI3	.823	$.823^2 = .677$	1 - .677 = .323			
SDI4	.802	$.802^2 = .643$	1 - .643 = .357			0.595
GOB1	.781	$.781^2 = .610$	1 - .610 = .390	59.5	0.913	>
GOB2	.765	$.765^2 = .585$	1 - .585 = .415			0.591
GOB3	.751	$.751^2 = .564$	1 - .564 = .436			
GOB5	.695	$.695^2 = .483$	1 - .483 = .517			
VIS1	.797	$.797^2 = .635$	1 - .635 = .365			

VIS2 VIS4 VIS5	.740 .764 .792	$.740^2 = .548$ $.764^2 = .548$ $.792^2 = .627$	1 - .548 = .452 1 - .548 = .416 1 - .627 = .373			

5.11 Hypothesis Testing Using Structural Equation Modelling (SEM)

In the previous section, separate confirmatory factor analyses of both organisational culture and SECI knowledge creation instrument were conducted. For this study, the purpose of the CFA is to empirically validate the overall construct by ensuring how the proposed specifications of the factors contemplate the model fit indices to the data (Hair et al., 2010). Thus, the measurement models of the both organisational culture and knowledge creation scales were carried out in order to empirically validate the hypothesis Ho1(a) and Ho1(b) through acceptable factor loadings and reasonable model fit estimates.

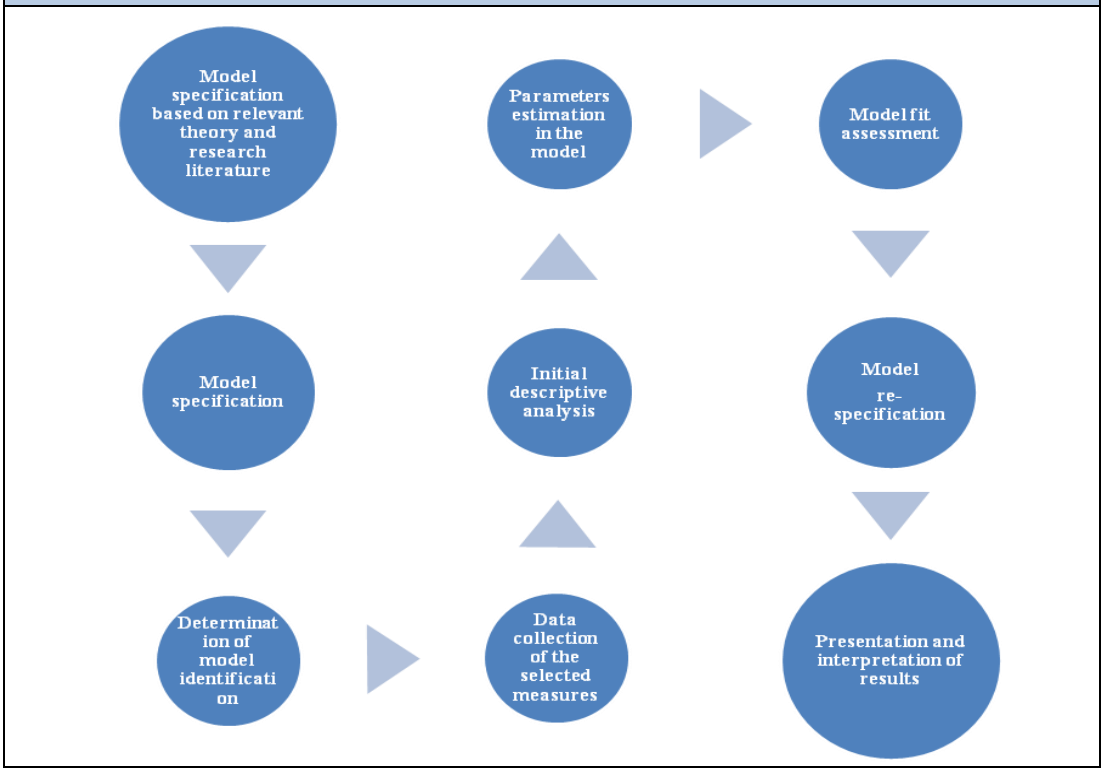
As described in the theoretical framework (see Section 3.1), this research recognises the elements of organisational culture in explaining variance in the contextually suitable variable of knowledge creation process. In order to address the quantitative strand of the mixed-method question (see Section 4.3), ten hypotheses have been drawn deductively based on cultural values and four knowledge creation modes. In the subsequent section, the hypothesis result of the series of hypotheses (H1, H2.....H10) using structural equation modelling (SEM) technique are summarised. Although, a massive amount of empirical research has been conducted in the field of knowledge creation research, there is a shortage of pervasive quantitative evidence that can serve the purpose of investigating the organisational culture and knowledge creation process (Rice and Rice, 2005). Therefore, the structural equation modelling (path analysis model) is considered as an appropriate method for hypotheses testing (Diamantopoulos and Siguaw, 2000). Following section summarises the process and design of the structural equation model in more detail.

5.11.1 Process and Design of the Structural Equation Model

In comparison to traditional statistical analyses techniques, the structural equation modeling is a multivariate analysis technique for measuring and testing relationships between observed and latent variables (Suhr, 2006). The process and design of structural equation model can be categories according to the major applications of

structural equation models. For example, the major applications of structural equation models fall into many different kinds of models such as, i) path analysis or causal model; ii) confirmatory factor analysis; iii) second order factor analysis; iii) regression model; iv) covariance structure model; and v) correlation structure model. The path analysis or causal model tests the hypothesised relationships among measured variables (e.g., manifest variables, latent variables, or both) with a linear equation system. A confirmatory factor analysis is a theory-driven technique in which relationship between latent variables and measured variables of specific hypotheses are tested through structure of the factor loadings and inter-correlations.

Figure 5.18: Process of Structural Equation Model – Suhr (2006)



However, a second order factor analysis model used to measure a variation of factor analysis through second order factor structure in which the correlation matrix of the common factors (or latent variables) provides a second order factors (Suhr, 2006). A regression model is a special case of SEM in which regression weights are specified and numerical values are constrained to be equal in order to satisfy the requirements of linear regression model (Kline, 1998). In contrast, a covariance structure model in SEM provides a covariance matrix to test the hypothesis of a set of variables that have equal variances. Another useful application of SEM is a correlation structure

model in which correlation matrix of a hypothesised model can be used for conceptualising, organising, and assessing 'interpersonal circumplex' or 'interpersonal circle' (Wiggins et al., 1981). However, this study seeks to plug-into the potential gap by providing structural equation models (SEM) using both confirmatory and exploratory modelling for theory testing and theory development of organisational culture and knowledge creation. For instance, a confirmatory factor analysis (CFA) (see Section 5.9.1, 5.9.2) was employed for theory testing through validity assessment of the selected variables for adequacy of the hypothesised factor structure. In contrast, a path analysis was applied in the structural part of the SEM for theory development of this study. For this, a causal model used to test the hypothesised relationships between organisational culture (exogenous variables) and knowledge creation (endogenous variables) with a linear equation system. Methodologically, a typical SEM analysis proceeds through the series of consecutive steps. Thus, the process (see Figure 5.18) by which the SEM was designed is based on the instructions of Suhr (2006). Detailed account of the process by which SEM was designed is as follows:

i) Model Specification based on Relevant Theory and Research Literature

The very first step of the process by which SEM can be designed is a valid hypothesised model based on relevant theory and relevant literature (Suhr, 2006). For instance, a theoretically established model and theoretically valid item specification provides a basis for successful implementation of SEM. The evaluation and interpretation of the results without addressing theoretical and philosophical criteria generally dissociated from the theory drawing from study (Baggozzi, 1984). For example, Baggozzi wrote that:

> ...theoretical argumentation can be an integral part of the evaluation of structural equation models. Although, it is not possible to generalise about theoretical criteria except in the most broad and vaguest terms such as well formed, internal consistence, etc., we can give a brief illustration in a revisit to a particular controversy; unidimensional multi-dimensional attitudes. (Baggozzi, 1988, p.92)

In terms of the model specification based on relevant theory and research literature, the both knowledge creation and organisational culture constructs used in this study provided a theoretical background for item specification in the context of knowledge intensive Pakistani banks. Likewise, the adequacy of the model and the degree of a specific parameter by which any model can be identified provided the evidence of over-determination of the factors.

ii) Model Specification (i.e. Equation, Diagram)

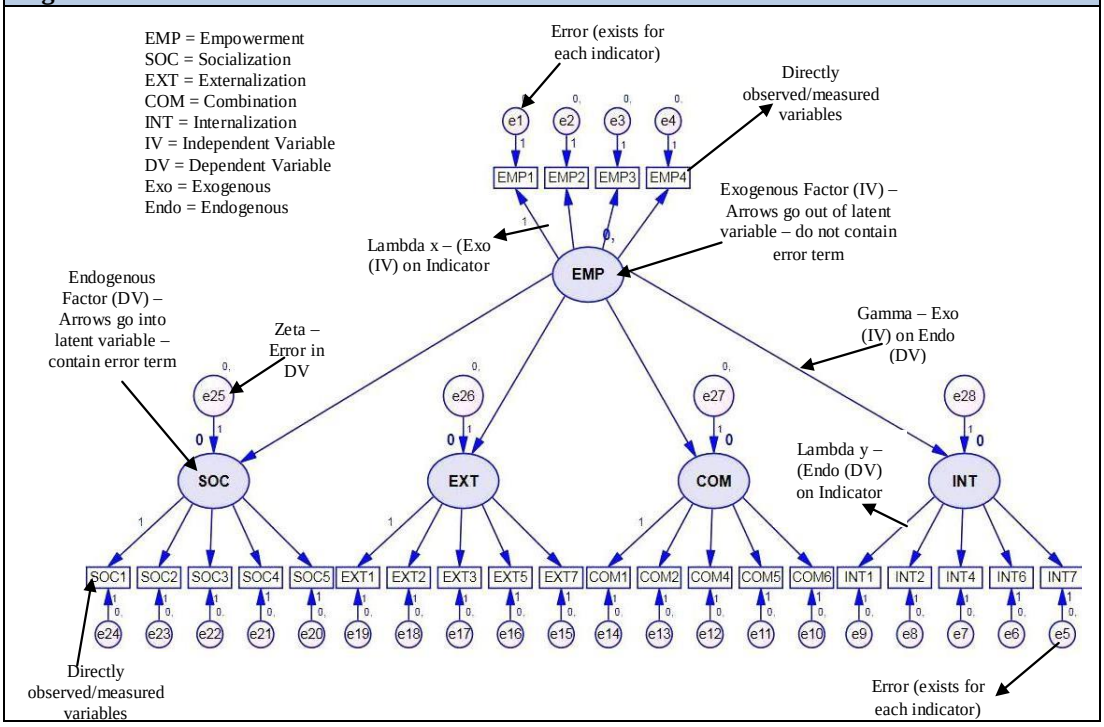
The process of SEM must follow some important and very basic logical points. Particularly, the basic logic to perform SEM is model specification which involves preparing a statement about a set of parameters and outlining a model (Suhr, 2006). For example, when CFA is used in SEM, the model must be specified in terms of researcher's hypothesis and the type of analysis attempting to confirm that hypothesis.

However, for building an accurately specified model, the dependent (endogenous) variable must be regressed on the independent (exogenous) variable. In other words, the dependent variable (DV) is being predicted by the independent variable (IV). The illustrated structural model specified for hypothesis testing in the Figure 5.18a contains one exogenous (i.e. independent) and four endogenous (i.e. dependent) variables. The exogenous variable does not attempt to explain the latent variable. However, in this model, endogenous variables have attempted to explain the latent variables. As mentioned in the theoretical framework (see Section 3.1), the process approach has a dominant role in the knowledge creation research (Travica, 2013). Therefore, the process approach taken in this study based on the Nonaka and Takeuchi's (1996) four knowledge creation process modes. The path diagram shown in Figure 5.18a indicates the structural relationship between each of the organisational culture value (i.e. EMP) and knowledge creation process (i.e. SOC, EXT, COM and INT), deliberately anchored in the model to examine the relationship between organisational culture and knowledge creation process.

As noted before, this study employed both measurement model and structural model for theory testing and theory development respectively. For instance, the

measurement part in the CFA shows the relations between latent variables and their indicators. In contrast, the structural part in the path analysis model indicates the potential causal dependencies between endogenous and exogenous variables. In other words, the process by which both measurement and structural model in SEM was designed for theory testing and development purposes.

Figure 5.18a: Structural Model Illustration



iii)Determination of the Model Identification

In SEM, the issue of identification is a mathematical requirement that entails whether or not parameters to be estimated consistent with the data points. The adequacy of the model and the acceptability of the sample size were also verified with the degree of over-determination of the factors. It suggested that, only over-identified model can be tested in which number of parameters are less than the number of data points. However, an under-identified model cannot be evaluated because parameters are more unpredictable and different parameter values define the same model. Mathematically, the data points can be computed by using equation p (p+1) / 2. Where, p refers to the observed variables.

In the case of hypothesis testing using SEM, an over-identification of the each model (see section 5.7…..5.17) has been tested. Hence, the results of each model indicate

parameters to be estimated consistent with the data points, hence, demonstrate over-identification. Also, the size of loadings (or regression weights) indicates a respectable portion of the variance within a corresponding factor while model fit results also indicated the statistical significance and marginally acceptable fit for the hypothesised models.

iv) Data Collection of the Selected Measures

The quantitative data collected from 50 branches of three commercial banks in Karachi. The five point Likert scale used to collect organisational culture and knowledge creation variables in the commonly employed estimation procedure. The OC is a 60 item instrument composed of 4 dimensions and 12 indexes. In contrast, KC is a 32 item instrument composed of 4 dimensions.

v) Initial Descriptive Analysis (e.g., Sample Size, Data Normality, Missing Data)

Another requirement for the process by which structural equation model can be design is to conduct initial descriptive analysis such as, sample size, data normality, and missing data before final analysis (Suhr, 2006). Therefore, descriptive data analysis carried out and results of frequency distribution (e.g. item-wise responses of the 5-point Likert scale), descriptive data (e.g. mean value, standard deviation) and data normality results (e.g. skewness and kurtosis) of both organisational culture and knowledge creation constructs intently included before applying the SEM. Specifically, the general rule of thumb of the minimum sample size (N) in factor analysis is not valid and useful. In terms of SEM, under some conditions relatively small sample may be sufficient than some other conditions in which significantly larger sample may be insufficient (MacCallum et al., 1999). Consequently, the issue of sample size (N) is thoroughly debated in the relevant literature. Thus, many of the benchmarks are agreed (Arrindell and Van der Ende, 1985). For example, N = 100 (Gorsuch, 1983 and Kline, 2011) or N = 200 (Guilford, 1954) or N = 250 (Cattell, 1978) are some of the suggested threshold limits. Comrey and Lee (1992) associate 100 = poor, 200 = fair, 300 = good, 500 = very good and 100 or more = excellent factor analysis result. Considering the sample to a variable (STV) ratio, Cattell (1978) recommended STV = 3 to 6, Gorsuch (1983) recommended STV = 5 and

Everitt (1975) recommended STV = 10 for acceptable model fit results. In the case of this study, the sample size (i.e. n = 131), however, valid for running CFA analysis. Also, minimum level of sample size (N) may also depend on other aspects of the design, such as; i) communality of the variables (or average variance extracted); ii) degree of over-determination of the factor (or a number of factors/number of variables); iii) size of loading; iv) model fit results (MacCallum et al., 1999). In this study, the average variance extracted (AVE) values of both (see sections 5.6.3 & 5.6.4) organisational culture and knowledge creation constructs supported an acceptable evidence of convergent validity of the latent construct. However, the maximum likelihood method of parameter estimation can also be used for data with minor deviations from normality (Raykov and Widaman, 1995). Therefore, the values of both skewness and kurtosis also included in order to save the useful explanations of the variables in the model.

vi) Parameters Estimation in the Model

The parameter estimation can be attained through comparing an actual covariance matrices and estimated covariance matrices. The best model fit estimates in SEM can be obtained through different criterions such as maximum likelihood, quasi-maximum likelihood, weighted least square and/or asymptotically distribution free methods (Suhr, 2006). The model fit estimates available by default in a specialised SEM analysis packages i.e. AMOS, Lisrel, EQS, and MPLUS. In case of this study, the researcher specified the both measurement and structural model for each construct by processing survey data (n = 131) in the statistical package IBM AMOS v19 with the maximum likelihood estimation method. The parameter estimation with ML method to achieve model fit allows numerical maximisation due to several reasons. For example, ML estimation is a default approach appropriate for non-normally distributed data and small sample size in which parameters can be estimated simultaneously (Suhr, 2006).

vii) Model Fit Assessment

In SEM, the decision of accepting or rejecting models can be taken on the basis of model fit assessment. The best fit model determines how well it fits with the data. In this study, a questionnaire survey data (n = 131) have been utilised using the

statistical package IBM AMOS v19. However, the adequacy of the hypothesised relationships have been assessed through different model fit outcomes such as: i) compare and contrast different model fit indices; ii) significance of the estimated paths between hypothesised latent variables for measuring a best fitting model on the basis of theoretical foundation; iii) squared multiple correlations (SMC) for strength of the hypothesised relationship and the amount of variance in each endogenous latent variable; iv) magnitude of the estimated parameters; and v) measurement error of the survey data.

However, for model fit assessment, researcher included three model fit indices, namely absolute fit index, alternative fit index and comparative fit index. The absolute fit index provides information about model fit when variance-covariance matrix (∑) equal to sample variance-covariance matrix (S) (Harrington, 2008). Out from other indices Chi-Square ($\chi 2$) is the most common absolute fit index that determines how the model fits exactly in the population. A large $\chi 2$ estimate means that the model does not fit the data well it does not reproduce sample covariance adequately. In contrast, a small $\chi 2$ estimate means that the model fits the data well as the predicted covariance matrix (Σ) is equivalent to the observed sample covariance matrix (S) (Albright and Park, 2009; Brown, 2006). However, in some situations, $\chi 2$ does not report precise valuation of model fit or the fit statistics may not clarify the conceptual viewpoints that could establish a hypothesis of the close fit between the model and population then an alternative fit statistic typically considered. Therefore, the root mean square error of approximation (RMSEA) also included for precise measurement. In general, RMSEA is the most important model fit statistics that may be used as an alternative for precise valuation of model fit. A comparative fit index provides the model fit statistics related to more controlled (or nested) baseline model when no relationship between variables is typically conceived as the co-variances amongst all input variables fixed at zero (Harrington, 2008; Brown, 2006). Thus, the comparative fit index results within range of the threshold limit considered for the evidence of unidimensionality (Byrne, 1994).

viii) Model Re-specification (Modification)

The SEM also allows model re-specification (modification) in order to improve the fit and estimated parameters of the variables. Almost, all statistical packages permit a minor modification in the model. For example, a modification index report might indicates the change in fixing parameter value from zero to one by adding a path to a model and freeing fixed parameter in order to improve χ^2 results (Suhr, 2006). Byrne (2010) suggested that the overall model fit can be improved with the elimination of items that contain low factor loading.

In other words, modifications in the initial model for the purpose that improve model fit often call for more modifications in the model (Suhr, 2006). These modifications can be undertaken in the measurement and structural models. In case of the changes in the measurement model, the impure indicators of the latent variables can either be removed or modified in order to effectively claim the theory. However, in case of changes in the structural model, the model re-specification and/or modification can be useful in terms of the theory testing and making claims for a theory to be true (Loehlin, 2004). In case of this study, eight items in the knowledge creation scale and twelve items in the organisational culture scale deleted due to low factor loadings and corresponding low squared multiple correlations. As a result of these changes, initial model fit results improved considerably.

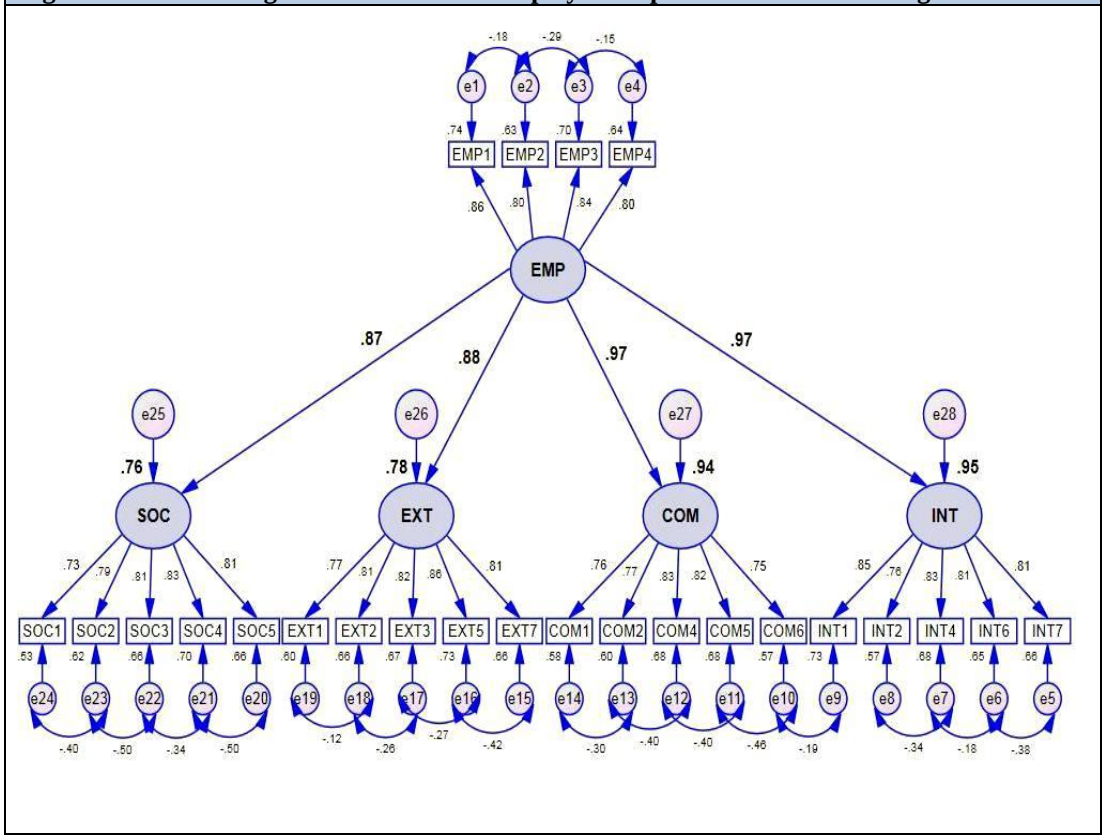
ix) Presentation and Interpretation of Results

The final step in the SEM is the presentation and interpretation of the results so that a claim about the construct can be made. For convenience, the researcher keeps information readily available while reporting results of this study. However, the model justification usually needs more detailed explanation of the results. Also, the interpretation of the theoretical claims on the basis of the best fitting model needs a valid causal conclusion (McDonald and Ho, 2002). In the presentation and interpretation of results of this study, the researcher reported needed results according to the suggested framework of previous studies. Following section summarises the hypothesis testing results in more detail.

5.12 Hypothesis H1 - Employee Empowerment & Knowledge Creation

As indicated, hypothesis H_1 based on the assumption that, employee empowerment may be a factor of employee knowledge creation process within the context of commercial banks in Pakistan. Figure 5.19 shows the path diagram based on employee empowerment and knowledge creation coefficients. It illustrates the strength of the relationships among the constructs and overall model fit of the hypothesised structural model.

Figure 5.19: Path Diagram based on H_1 - Employee Empowerment & Knowledge Creation



The AMOS path diagram contains total 57 (24 observed + 33 unobserved) variables. More specifically, this model contains 24 observed (20 knowledge creation items + 04 organisational empowerment items) variables, 33 unobserved (28 error terms + 05 factors) variables, 33 exogenous variables (28 error terms + 05 factors) and 33 endogenous (28 observed variables + 05 factors) variables. To produce an over-identified model, the first regression path in each measurement component was fixed at 1. Since, this model includes 300 data points and 109 parameters to be estimated. It indicates that the model is over-identified with 252 degrees of freedom.

Table 5.18: Standardised Regression Weights and Squared Multiple Correlations (R^2)			
Path	**Regression Weights**	**Observed Variable**	**R^2 / SMC**
EMP1 ← EMP	.85	EMP1	.73
EMP2 ← EMP	.79	EMP2	.63
EMP3 ← EMP	.83	EMP3	.70
EMP4 ← EMP	.80	EMP5	.64
SOC1 ← SOC	.72	SOC1	.53
SOC2 ← SOC	.78	SCO2	.62
SOC3 ← SOC	.81	SOC3	.66
SOC4 ← SOC	.83	SOC4	.69
SOC5 ← SOC	.81	SOC5	.65
EXT1 ← EXT	.77	EXT1	.60
EXT2 ← EXT	.81	EXT2	.65
EXT3 ← EXT	.82	EXT3	.67
EXT5 ← EXT	.85	EXT5	.73
EXT7 ← EXT	.81	EXT7	.66
COM1 ← COM	.76	COM1	.58
COM2 ← COM	.77	COM2	.59
COM4 ← COM	.82	COM4	.68
COM5 ← COM	.82	COM5	.67
COM6 ← COM	.75	COM6	.56
INT1 ← INT	.85	INT1	.72
INT2 ← INT	.75	INT2	.57
INT4 ← INT	.82	INT3	.68
INT6 ← INT	.80	INT4	.65
INT7 ← INT	.81	INT7	.66
Independent Variable: CDT = Capability Development Dependent Variable: SOC = Socialisation, EXT = Externalisation, COM = Combination and INT = Internalisation			

In SEM, regression weight (path coefficient) indicates the correlation between the observed variable and the corresponding common factor. Table 5.18 shows the estimated values of standardised estimates under standardised regression weights and squared multiple correlations (R^2). The R^2 value of each observed variable also appeared in figure 4.7 that have a directional arrow coming into it. For example, the R^2 value for EMP1, EMP2, EMP3, EMP4 is .85, .79, .83 and .80 respectively. The R^2 or SMC is a squared value of regression weight that indicates a respectable portion of the variance within corresponding factor (Everitt and Skrondal, 2002). Statistically, the R^2 value ranges from 0 (no linear relationship) to 1 (perfect linear relationship). In other words, the R^2 value approaching 1.0 indicates that the regression line fits the dataset. In contrast, R^2 value approaching 0 indicates that the regression line does not fit the dataset.

The measurement portion in the present model is relatively good (Bentler and Yuan, 1999). For example, SOC4 (.69), EXT5 (.73), COM4 (.68), INT1 (.72) and EMP1 (.73) representing the highest standardised regression weights. In contrast, SOC1 (.53), EXT1 (.60), COM6 (.56), INT2 (.57) and EMP2 (.63) has a lowest regression weights. Additionally, all the R^2 values (as arranged in Table 5.18) are analogous to the corresponding regression weights of each observed value also indicates the respectable portion of the variance within a particular factor. For example, SOC explain 47.6% (SOC4 ← SOC = $.69^2$) of variation in SOC4. It found that, all of the regression weights are significant enough thus each of survey items tapping information on their respective value dimension.

Table 5.19: Model Fit Results based on H1

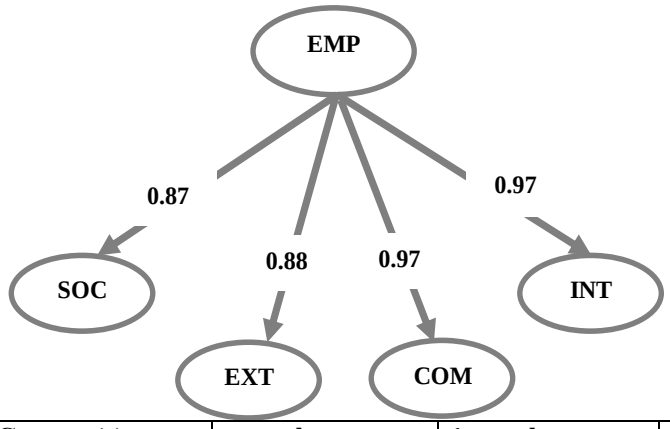
Model Fit Indices	Model Fit Results	Model Fit Threshold Limit
Absolute Fit Indices		
Chi-square	348.835	Smaller the better
Degrees of freedom	229	Smaller the better
Ratio of $\chi 2$ to df	1.523	≤ 2 or 3
Browne Cudeck Criterion	583.228	Smaller the better
Root Mean Square Residual	.063	>.05 but < .08 reasonable fit
Comparative Fit Indices		
Comparative Fit Index	954	0 > CFI > 1 for acceptance
Tucker–Lewis Index	.945	0 > TLI > 1 for acceptance
Incremental Fit Index	.955	≥ 0.95 for acceptance
Normed Fit Index	.879	≥ 0.95 for acceptance
*Relative Non-Centrality Fit Index	.854	≥ 0.95 for acceptance
Predictive Fit Indices		
Akaike Information Criterion	538.835	Smaller the better
Expected Cross-Validation Index	4.909	Smaller the better
****Parsimonious Fit Indices**		
Parsimony-Adjusted – NFI	.729	Closer to 1 the better
Parsimony-Adjusted – CFI	.792	

*Similar to CFI but can be negative, therefore, CFI better choice.
** Very sensitive to model size
Source: Carmines and McIver (1981), Hu and Bentler (1999), Browne et al., (1993)

For determining the overall fit of the model, four model fit indices were used with their respective indices. Table 5.19 shows the model fit results of hypothesised model H1. The chi-squared statistic showed no discrepancy from the perfect fit at the 5% significance level. It found that the chi-square value ($\chi 2 = 348.835$) indicates that this model fits the data perfectly in the population at probability level (p-value) less

than 0.05. In the similar vein, a ratio of chi-square to degree of freedom ($\chi 2/df$ = 348.835/229 = 1.523) also indicate that the model is statistically significant at *p < .000. Additionally, the results of absolute fit indices, i.e. BCC = 583.228 and RMSEA = .063 also provided a marginally acceptable fit for the hypothesised model. The comparative fit statistics demonstrated a good fit in all aspects as the estimated values, i.e. CFI = .954, TLI = .945, IFI = .955, NFI = .879 and RFI = .854 hanged behind the threshold limit. However, two predictive fit indices, AIC = 538.835 and ECVI = 4.082 also demonstrated a good fit to the data. Table 5.19 also presented two parsimonious fit indices results. It found that the PNFI = .729 and PCFI = .792 indicated that the hypothesised model fits with the data well.

Figure 5.20: Hypothesis Testing based on H1



Path	Gamma (γ)	[c]t – value	[d]p – value	Result
SOC ← EMP	0.87	8.878	.000	
EXT ← EMP	0.88	9.655	.000	Strongly
COM ← EMP	0.97	10.487	.000	Supported
INT ← EMP	0.97	12.601	.000	

[a]Similar to CFI but can be negative, therefore CFI better choice.
[b]Very sensitive to model size
[c]t > 1.96
[d]p < 0.05
Source: Hu and Bentler (1999), Browne et al., (1993), Carmines and McIver (1981)

H1: For hypotheses test from the research model, a combined measurement and structural model was examined. Figure 5.20 illustrates the structural relationship amongst the exogenous (independent) and endogenous (dependent) variables. In this path analysis model, arrows go out of exogenous variable (EMP) and go into four endogenous variables (SOC, EXT, COM, and INT). For simplicity, Figure 5.20 only shows the IV's and DV's as we trimmed off the observed variables (rectangles), the connected errors (delta + epsilon) and the single-headed arrows (lambda X + lambda

Y). Mathematically, the strength of the paths can be determined through [10]gamma (γ) and [11]beta (β) values. Since, higher gamma (γ) and beta (β) value indicate the strength of the relationship between exogenous (independent) and endogenous (dependent) variables. As shown, structural relationship between empowerment and four knowledge creation process is significant at p-value < 0.05. The organisational culture factor had a significant impact on knowledge creation process. The impact of empowerment on four knowledge creation modes (SOC ← EMP: $\gamma = 0.87$, $t = 8.878$, p-value < 0.01), (EXT ← EMP: $\gamma = 0.88$, $t = 9.655$, p-value < 0.01), (COM ← EMP: $\gamma = 0.97$, $t = 10.587$, p-value < 0.01) and (INT ← EMP: $\gamma = 0.97$, $t = 12.601$, p-value < 0.01) found to be significant.

[10] GAMMA (γ) - Structural path, regression coefficient, or standardised 'beta weight' from an exogenous (independent) variable to an endogenous (dependent) variable

[11] BETA (β) - Structural path, regression coefficient or standardised 'beta weight' from an endogenous variable to an endogenous variable.

5.13 Hypothesis H2 - Capability Development & Knowledge Creation

As indicated, hypothesis H2 based on the assumption that, capability development may be a factor of employee knowledge creation process within the context of commercial banks in Pakistan. This model contains 300 data points and 109 parameters to be estimated. It indicates that the model is over-identified with 225 degrees of freedom.

Table 5.20: Model Fit & Hypothesis Testing Results based on H2

Absolute Fit Indices
Chi-square = 435.360
Degrees of freedom = 225
Ratio of $\chi 2$ to df = 1.934
Browne Cudeck Criterion = 679.622
Root Mean Square Residual = 0.084

Comparative Fit Indices
Comparative Fit Index = 0.905
Tucker–Lewis Index = 0.883
Incremental Fit Index = 0.907
Normed Fit Index = 0.824
[a]Relative Non-Centrality Fit Index = 0.785

Predictive Fit Indices
Akaike Information Criterion = 633.360
Expected Cross-Validation Index = 4.798

[b]**Parsimonious Fit Indices**
Parsimony-Adjusted – NFI = 0.672
Parsimony-Adjusted – CFI = 0.737

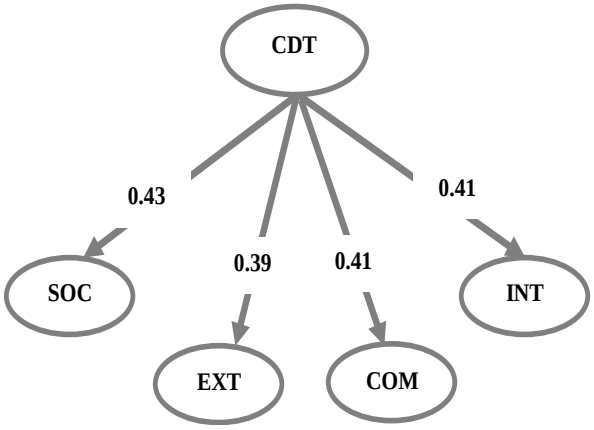


Figure 5.21: Path Estimates based on H2

Path	Gamma (γ)	[c]t – value	[d]p – value	Result
SOC ← CDT	0.43	4.892	.000	
EXT ← CDT	0.39	4.402	.000	Partially
COM ← CDT	0.41	4.575	.000	Supported
INT ← CDT	0.41	4.538	.000	

[a]Similar to CFI but can be negative, therefore CFI better choice.
[b]Very sensitive to model size
[c]$t > 1.96$
[d]$p < 0.05$
Source: Hu and Bentler (1999), Browne et al., (1993), Carmines and McIver (1981)

Table 5.21 showed the standardised estimates under standardised regression weights and estimated values of squared multiple correlations (R^2). In SEM, each variable exhibits only a single common factor loading (usually termed as standardised loading) represents the correlation (R^2) between each observed variable and the corresponding factor. In the present model, the measurement portion of the model is

relatively good (Bentler and Yuan, 1999). For example, SOC2 (.82), EXT2 (.85), COM4 (.87), INT4 (.87) and CDT2 (.76) representing the highest standardised regression weights. In contrast, SOC4 (.80), EXT7 (.79), COM6 (.75), INT7 (.66) and CDT1 (.66) has a lowest regression weights. Additionally, R^2 value analogous to the regression weight of each observed value indicates the respectable portion of the variance within a respective factor. For example, CDT explain 47.6% (CDT ← CDT4 = $.69^2$) of variation in CDT4. It found that, all of the regression weights are significant enough thus each of survey items tapping information on their respective value dimension.

Table 5.21: Standardised Regression Weights and Squared Multiple Correlations (R^2)

Path	Regression Weights	Observed Variable	R^2 / SMC
CDT1 ← CDT	.81	CDT1	.66
CDT2 ← CDT	.87	CDT2	.76
CDT3 ← CDT	.84	CDT3	.71
CDT4 ← CDT	.83	CDT5	.69
SOC1 ← SOC	.86	SOC1	.74
SOC2 ← SOC	.83	SCO2	.69
SOC3 ← SOC	.82	SOC3	.67
SOC4 ← SOC	.80	SOC4	.64
SOC5 ← SOC	.80	SOC5	.64
EXT1 ← EXT	.82	EXT1	.68
EXT2 ← EXT	.85	EXT2	.73
EXT3 ← EXT	.84	EXT3	.72
EXT5 ← EXT	.81	EXT5	.66
EXT7 ← EXT	.79	EXT7	.62
COM1 ← COM	.80	COM1	.64
COM2 ← COM	.80	COM2	.64
COM4 ← COM	.86	COM4	.74
COM5 ← COM	.80	COM5	.64
COM6 ← COM	.75	COM6	.56
INT1 ← INT	.81	INT1	.66
INT2 ← INT	.77	INT2	.60
INT4 ← INT	.84	INT3	.71
INT6 ← INT	.76	INT4	.58
INT7 ← INT	.66	INT7	.43

Independent Variable: CDT = Capability Development
Dependent Variable: SOC = Socialisation, EXT = Externalisation, COM = Combination and INT = Internalisation

Table 5.20 shows the model fit results of hypothesised model H_2. The chi-squared statistic showed no discrepancy from the perfect fit at the 5% significance level. It

found that the chi-square value ($\chi 2 = 435.360$) indicates that this model fits the data perfectly in the population at probability level (p-value) that is less than 0.05. In the similar vein, a ratio of chi-square to degree of freedom ($\chi 2/df = 435.360 / 225 = 1.934$) also indicate that the model is statistically significant at *p < .000. In addition, the results of absolute fit indices, i.e. BCC = 679.622 and RMSEA = .084 also provided a marginally acceptable fit for the hypothesised model. The comparative fit statistics demonstrated a good fit in all aspects as the estimated values, i.e. CFI = .905, TLI = .883, IFI = .907, NFI = .824 and RFI = .785 hanged behind the threshold limit. However, two predictive fit indices, AIC = 633.360 and ECVI = 4.798 also demonstrated a good fit to the data. Table 5.20 also presented two parsimonious fit indices results. It found that the PNFI = .672 and PCFI = .737 indicated that the hypothesised model fits the data well.

H2: Figure 5.21 illustrates the structural relationship amongst the exogenous (independent) and endogenous (dependent) variables. In this path analysis model, arrows go out of exogenous variable (CDT) and go into four endogenous variables (SOC, EXT, COM, and INT). As shown, structural relationship between capability development and four knowledge creation modes is significant at p-value < 0.05. The χ^2 statistic for model fit reveals that the model is a good fit to the data so that the null hypothesis can be rejected. In addition, the organisational culture factor had a significant impact on knowledge creation capability. The impact of capability development on four knowledge creation process (SOC ← CDT: $\gamma = 0.43$, $t = 4.892$, p-value < 0.01), (EXT ← CDT: $\gamma = 0.39$, $t = 4.402$, p-value < 0.01), (COM ← CDT: $\gamma = 0.41$, $t = 4.575$, p-value < 0.01) and (INT ← CDT: $\gamma = 0.41$, $t = 4.538$, p-value < 0.01) found to be significant.

5.14 Hypothesis H3 - Team Orientation & Knowledge Creation

Figure 5.22 shows a path diagram based on team orientation and knowledge creation coefficients. This model contains 300 data points and 109 parameters to be estimated. It indicates that the model is over-identified with 232 degrees of freedom.

Table 5.22: Model Fit & Hypothesis Testing Results based on H3

Absolute Fit Indices
Chi-square = 329.900
Degrees of freedom = 232
Ratio of $\chi 2$ to df = 1.421
Browne Cudeck Criterion = 556.891
Root Mean Square Residual = 0.024

Comparative Fit Indices
Comparative Fit Index = 0.953
Tucker–Lewis Index = 0.945
Incremental Fit Index = 0.954
Normed Fit Index = 0.861
[a]Relative Non-Centrality Fit Index = 0.835

Predictive Fit Indices
Akaike Information Criterion = 513.900
Expected Cross-Validation Index = 3.893

[b]**Parsimonious Fit Indices**
Parsimony-Adjusted – NFI = 0.724
Parsimony-Adjusted – CFI = 0.801

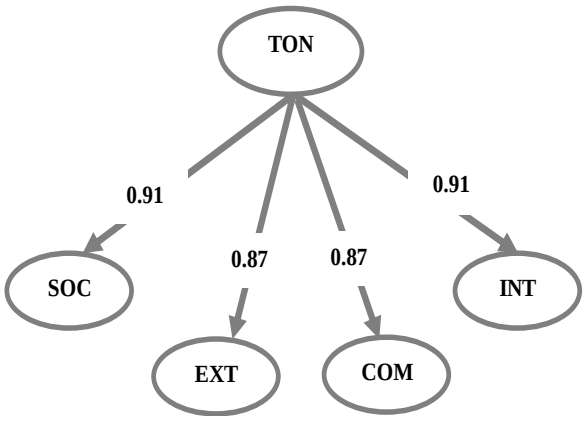


Figure 5.22: Path Estimates based on H3

Path	Gamma (γ)	[c]t – value	[d]p – value	Result
SOC ← TON	0.91	8.689	.000	Strongly Supported
EXT ← TON	0.87	8.067	.000	
COM ← TON	0.87	7.932	.000	
INT ← TON	0.91	8.312	.000	

[a]Similar to CFI but can be negative, therefore CFI better choice.
[b]Very sensitive to model size
[c]t > 1.96
[d]p < 0.05
Source: Hu and Bentler (1999), Browne et al., (1993), Carmines and McIver (1981)

The results summarised in the Table 5.23 shows the standardised estimates under standardised regression weights and estimated values of squared multiple correlations (R^2). In the present model, the measurement portion of the model is relatively good (Bentler and Yuan, 1999). For example, SOC1 (.87), EXT3 (.84), COM4 (.85), INT1 (.82) and TON1 (.49) represent the highest standardised regression weights. In contrast, SOC4 (.79), EXT7 (.81), COM6 (.76), INT7 (.69) and TON5 (.04) has a lowest regression weights. Additionally, R^2 value analogous to

the regression weight of each observed value (as arranged in Table 5.23) indicates the respectable portion of the variance within a respective factor. For example, INT explain 23.0% (INT7 ← INT = $.48^2$) of variation in INT7. It found that, all of the regression weights are significant enough thus each of the survey items tapping information on their respective value dimension.

Table 5.23: Standardised Regression Weights and Squared Multiple Correlations (R^2)

Path	Regression Weights	Observed Variable	R^2 / SMC
TON1 ← TON	.70	TON1	.49
TON2 ← TON	.18	TON2	.03
TON3 ← TON	.64	TON3	.41
TON5 ← TON	.04	TON5	.00
SOC1 ← SOC	.86	SOC1	.75
SOC2 ← SOC	.83	SCO2	.69
SOC3 ← SOC	.81	SOC3	.66
SOC4 ← SOC	.79	SOC4	.63
SOC5 ← SOC	.80	SOC5	.64
EXT1 ← EXT	.82	EXT1	.67
EXT2 ← EXT	.83	EXT2	.70
EXT3 ← EXT	.83	EXT3	.70
EXT5 ← EXT	.82	EXT5	.67
EXT7 ← EXT	.81	EXT7	.65
COM1 ← COM	.80	COM1	.64
COM2 ← COM	.80	COM2	.64
COM4 ← COM	.85	COM4	.72
COM5 ← COM	.80	COM5	.64
COM6 ← COM	.75	COM6	.57
INT1 ← INT	.82	INT1	.67
INT2 ← INT	.76	INT2	.58
INT4 ← INT	.82	INT3	.67
INT6 ← INT	.76	INT4	.58
INT7 ← INT	.68	INT7	.47

Independent Variable: CDT = Capability Development
Dependent Variable: SOC = Socialisation, EXT = Externalisation, COM = Combination and INT = Internalisation

Table 5.22 shows the model fit results of hypothesised model H_3. The chi-squared statistic showed no discrepancy from the perfect fit at the 5% significance level. It found that the chi-square value ($\chi 2 = 329.900$) indicates that this model fits the data perfectly in the population at probability level (p-value) that is less than 0.05. In the similar vein, a ratio of chi-square to degree of freedom ($\chi 2/df = 329.900 / 232 = 1.421$) also indicate that the model is statistically significant at $*p < .000$. In addition, the results of absolute fit indices, i.e. BCC = 556.891 and RMSEA = .024 also

provided a marginally acceptable fit for the hypothesised model. The comparative fit statistics demonstrated a good fit in all aspects as the estimated values, i.e. CFI = .953, TLI = .945, IFI = .954, NFI = .861 and RFI = .835 hanged behind the threshold limit. However, two predictive fit indices, AIC = 513.900 and ECVI = 3.893 also demonstrated a good fit to the data. Table 5.22 also presented two parsimonious fit indices results. It found that the PNFI = .724 and PCFI = .801 indicated that the hypothesised model fits the data well.

H_3: Figure 5.22 illustrates the structural relationship amongst the exogenous (independent) and endogenous (dependent) variables. In this path analysis model, arrows go out of exogenous variable (TON) and go into four endogenous variables (SOC, EXT, COM, and INT). As shown, structural relationship between team orientation and four knowledge creation modes is significant at p-value < 0.05. The χ^2 statistic for model fit reveals that the model is a good fit to the data so that the null hypothesis can be rejected. In addition, the organisational culture factor had a significant impact on knowledge creation capability. The impact of team orientation on four knowledge creation modes (SOC ← TON: $\gamma = 0.91$, $t = 8.68$, p-value < 0.01), (EXT ← TON: $\gamma = 0.87$, $t = 8.06$, p-value < 0.01), (COM ← TON: $\gamma = 0.87$, $t = 7.93$, p-value < 0.01) and (INT ← TON: $\gamma = 0.91$, $t = 8.31$, p-value < 0.01) found to be significant.

5.15 Hypothesis H4 – Core Values & Knowledge Creation

Figure 5.23 shows the path diagram based on core values and knowledge creation coefficients. This model contains 300 data points and 109 parameters to be estimated. It indicates that the model is over-identified with 232 degrees of freedom. Table 5.25 shows the standardised regression weights and estimated values of squared multiple correlations (R^2).

Table 5.24: Model Fit & Hypothesis Testing Results based on H4

Absolute Fit Indices
Chi-square = 413.876
Degrees of freedom = 232
Ratio of $\chi 2$ to df = 1.783
Browne Cudeck Criterion = 640.867
Root Mean Square Residual = 0.077

Comparative Fit Indices
Comparative Fit Index = 0.908
Tucker–Lewis Index = 0.891
Incremental Fit Index = 0.910
Normed Fit Index = 0.816
[a]Relative Non-Centrality Fit Index = 0.781

Predictive Fit Indices
Akaike Information Criterion = 597.876
Expected Cross-Validation Index = 4.529

[b]**Parsimonious Fit Indices**
Parsimony-Adjusted – NFI = 0.686
Parsimony-Adjusted – CFI = 0.763

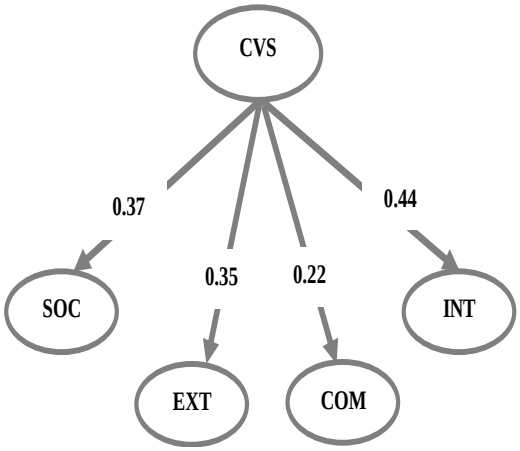


Figure 5.23: Path Estimates based on H4

Path	Gamma (γ)	[c]t – value	[d]p – value	Result
SOC ← CVS	0.37	3.94	.000	Strongly Supported
EXT ← CVS	0.35	3.82	.000	
COM ← CVS	0.22	2.85	.004	
INT ← CVS	0.44	5.08	.000	

[a]Similar to CFI but can be negative, therefore CFI better choice.
[b]Very sensitive to model size
[c]$t > 1.96$
[d]$p < 0.05$
Source: Hu and Bentler (1999), Browne et al., (1993), Carmines and McIver (1981)

In the present model, the measurement portion of the model is relatively good (Bentler and Yuan, 1999). For example, SOC2 (.86), EXT2 (.89), COM2 (.95), INT1 (.95) and CVS2 (.89) representing the highest standardized regression weights. In contrast, SOC4 (.77), EXT7 (.74), COM5 (.70), INT7 (.64) and CVS3 (.55) has a lowest regression weights. In addition, R^2 value corresponding to the regression weight of each observed value indicates the respectable portion of the variance

within a respective factor. For example, CVS explain 62.4% (CVS2 ← CVS = $.79^2$) of variation in CVS2. It found that, all of the regression weights are significant enough thus each of survey items tapping information on their respective value dimension.

Table 5.25: Standardised Regression Weights and Squared Multiple Correlations (R^2)

Path	Regression Weights	Observed Variable	R^2 / SMC
CVS2 ← CVS	.88	CVS1	.78
CVS3 ← CVS	.55	CVS2	.30
CVS4 ← CVS	.80	CVS3	.65
CVS5 ← CVS	.62	CVS5	.39
SOC1 ← SOC	.84	SOC1	.71
SOC2 ← SOC	.85	SCO2	.73
SOC3 ← SOC	.84	SOC3	.71
SOC4 ← SOC	.76	SOC4	.59
SOC5 ← SOC	.82	SOC5	.68
EXT1 ← EXT	.82	EXT1	.67
EXT2 ← EXT	.88	EXT2	.78
EXT3 ← EXT	.87	EXT3	.76
EXT5 ← EXT	.80	EXT5	.64
EXT7 ← EXT	.74	EXT7	.55
COM1 ← COM	.89	COM1	.79
COM2 ← COM	.95	COM2	.90
COM4 ← COM	.91	COM4	.84
COM5 ← COM	.70	COM5	.49
COM6 ← COM	.70	COM6	.50
INT1 ← INT	.94	INT1	.89
INT2 ← INT	.80	INT2	.64
INT4 ← INT	.78	INT3	.61
INT6 ← INT	.60	INT4	.36
INT7 ← INT	.64	INT7	.40

Independent Variable: CDT = Capability Development
Dependent Variable: SOC = Socialisation, EXT = Externalisation, COM = Combination and INT = Internalisation

Table 5.24 shows the model fit results of hypothesised model H_4. The chi-square statistic showed no discrepancy from the perfect fit at the 5% significance level. It found that the chi-square value ($\chi 2 = 413.876$) indicates that this model fits the data perfectly in the population at probability level (p-value) that is less than 0.05. In the similar vein, a ratio of chi-square to degree of freedom ($\chi 2/df = 413.876 / 232 = 1.783$) also indicate that the model is statistically significant at $*p < .000$. In addition, the results of absolute fit indices, i.e., BCC = 640.867 and RMSEA = .077 also

provided a marginally acceptable fit for the hypothesised model. The comparative fit statistics demonstrated a good fit in all aspects as the estimated values, i.e. CFI = .908, TLI = .891, IFI = .910, NFI = .816 and RFI = .781 hanged behind the threshold limit. However, two predictive fit indices, AIC = 597.876 and ECVI = 4.529 also demonstrated a good fit to the data. Table 5.23 also presented two parsimonious fit indices results. It found that the PNFI = .686 and PCFI = .763 indicated that the hypothesised model fits the data well.

H4: Figure 5.23 illustrates the structural relationship amongst the exogenous (independent) and endogenous (dependent) variables. In this path analysis model, arrows go out of exogenous variable (CVS) and go into four endogenous variables (SOC, EXT, COM, and INT). As shown, structural relationship between core values and four knowledge creation modes is significant at p-value < 0.05. The χ^2 statistic for model fit reveals that the model is a good fit to the data so that the null hypothesis can be rejected. In addition, the organisational culture factor had a significant impact on knowledge creation process. The impact of core values on four knowledge creation modes (SOC ← CVS: $\gamma = 0.37$, $t = 3.940$, p-value < 0.01), (EXT ← CVS: $\gamma = 0.35$, $t = 3.827$, p-value < 0.01), (COM ← CVS: $\gamma = 0.22$, $t = 2.859$, p-value < 0.01) and (INT ← CVS: $\gamma = 0.44$, $t = 5.080$, p-value < 0.01) found to be significant.

5.16 Hypothesis H_5 - Coordination & Integration & Knowledge Creation

As indicated, hypothesis H_5 based on the assumption that, employee coordination and integration may be a factor of employee knowledge creation capability within the context of commercial banks in Pakistan. This over-identified model contains 300 data points and 109 parameters to be estimated.

Table 5.26: Model Fit & Hypothesis Testing Results based on H_5

Absolute Fit Indices
Chi-square = 402.390
Degrees of freedom = 235
Ratio of $\chi 2$ to df = 1.71
Browne Cudeck Criterion = 621.979
Root Mean Square Residual = 0.073

Comparative Fit Indices
Comparative Fit Index = 0.921
Tucker–Lewis Index = 0.908
Incremental Fit Index = 0.923
Normed Fit Index = 0.833
[a]Relative Non-Centrality Fit Index = 0.804

Predictive Fit Indices
Akaike Information Criterion = 580.390
Expected Cross-Validation Index = 4.397

[b]**Parsimonious Fit Indices**
Parsimony-Adjusted – NFI = 0.709
Parsimony-Adjusted – CFI = 0.785

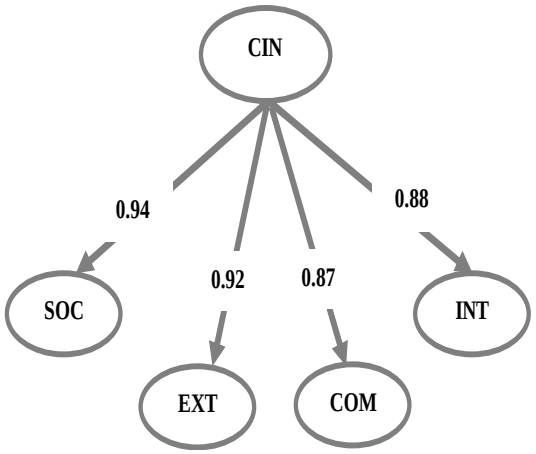


Figure 5.24: Path Estimates based on H5

Path	Gamma (γ)	[c]t – value	[d]p – value	Result
SOC ← CIN	0.94	9.97	.000	Strongly Supported
EXT ← CIN	0.92	9.17	.000	
COM ← CIN	0.87	8.67	.000	
INT ← CIN	0.88	8.92	.000	

[a]Similar to CFI but can be negative, therefore CFI better choice.
[b]Very sensitive to model size
[c]$t > 1.96$
[d]$p < 0.05$
Source: Hu and Bentler (1999), Browne et al., (1993), Carmines and McIver (1981)

Table 5.27 reported the standardised regression weights and estimated values of squared multiple correlations (R^2). In the present model, the measurement portion of the model is relatively good (Bentler and Yuan, 1999). It found that, SOC1 (.85), EXT7 (.82), COM4 (.86), INT1 (.84) and CIN1 (.59) represents the highest standardised regression weights. In contrast, SOC2 (.76), EXT5 (.75), COM6 (.75), INT7 (.76) and CIN5 (.05) has a lowest regression weights. In addition, the corresponding R^2 value analogous to the regression weight also indicates the

reasonable portion of the variance within exogenous and endogenous variables. For example, COM explain 40.9% (COM5 ← COM = $.64^2$) of variation in COM5. In general, all of the regression weights are significant enough thus each of survey items tapping information on their respective value dimension.

Table 5.27: Standardised Regression Weights and Squared Multiple Correlations (R^2)

Path	Regression Weights	Observed Variable	R^2 / SMC
CIN1 ← CIN	.76	CIN1	.58
CIN2 ← CIN	.18	CIN2	.03
CIN3 ← CIN	.74	CIN3	.55
CIN5 ← CIN	.06	CIN5	.004
SOC1 ← SOC	.85	SOC1	.72
SOC2 ← SOC	.76	SCO2	.58
SOC3 ← SOC	.78	SOC3	.61
SOC4 ← SOC	.77	SOC4	.60
SOC5 ← SOC	.78	SOC5	.61
EXT1 ← EXT	.80	EXT1	.65
EXT2 ← EXT	.75	EXT2	.57
EXT3 ← EXT	.79	EXT3	.63
EXT5 ← EXT	.75	EXT5	.56
EXT7 ← EXT	.81	EXT7	.66
COM1 ← COM	.80	COM1	.64
COM2 ← COM	.80	COM2	.65
COM4 ← COM	.85	COM4	.73
COM5 ← COM	.80	COM5	.64
COM6 ← COM	.75	COM6	.56
INT1 ← INT	.84	INT1	.70
INT2 ← INT	.79	INT2	.63
INT4 ← INT	.84	INT3	.71
INT6 ← INT	.79	INT4	.62
INT7 ← INT	.75	INT7	.57

Independent Variable: CDT = Capability Development
Dependent Variable: SOC = Socialisation, EXT = Externalisation, COM = Combination and INT = Internalisation

Table 5.26 shows the model fit results of hypothesised model H_5. The chi-squared statistic showed no discrepancy from the perfect fit at the 5% significance level. It found that the chi-square value ($\chi 2 = 402.390$) indicates the fitness of this model with the population at cut-off probability ($p \leq 0.05$) level. In the similar vein, a ratio of chi-square to degree of freedom ($\chi 2/df = 402.390 / 235 = 1.71$) also indicate that the model is statistically significant at $p < .000$. In addition, the results of absolute fit indices, i.e. BCC = 621.979 and RMSEA = .073 also provided a marginally

acceptable fit for the hypothesized model. The comparative fit statistics demonstrated a good fit in all aspects as the estimated values, i.e. CFI = .921, TLI = .908, IFI = .923, NFI = .833 and RFI = .804 hanged behind the threshold limit. However, two predictive fit indices, AIC = 580.390 and ECVI = 4.397 also demonstrated a good fit to the data. Table 5.26 also presented two parsimonious fit indices results. It found that the PNFI = .709 and PCFI = .785 indicated that the hypothesised model fits the data

H_5: Figure 5.24 illustrates the structural relationship amongst the exogenous (independent) and endogenous (dependent) variables. In this path analysis model, arrows go out of exogenous variable (CIN) and go into four endogenous variables (SOC, EXT, COM, and INT). As shown, structural relationship between coordination and integration and four knowledge creation modes is significant at p-value < 0.05. The χ^2 statistic for model fit reveals that the model is a good fit to the data so that the null hypothesis can be rejected. In addition, the organisational culture factor had a significant impact on knowledge creation process. The impact of coordination and integration on four knowledge creation modes (SOC ← CIN: γ = 0.94, t = 9.979, p-value < 0.01), (EXT ← CIN: γ = 0.92, t = 9.173, p-value < 0.01), (COM ← CIN: γ = 0.87, t = 8.672, p-value < 0.01) and (INT ← CIN: γ = 0.88, t = 8.929, p-value < 0.01) found to be significant.

5.17 Hypothesis H6 – Organisational Change & Knowledge Creation

As indicated, hypothesis H_6 based on the assumption that, organisational change may be a factor of employee knowledge creation process within the context of commercial banks in Pakistan. This over-identified model contains 300 data points and 109 parameters to be estimated with 252 degrees of freedom.

Table 5.28: Model Fit & Hypothesis Testing Results based on H6

Absolute Fit Indices
Chi-square = 439.588
Degrees of freedom = 230
Ratio of $\chi 2$ to df = 1.91
Browne Cudeck Criterion = 671.483
Root Mean Square Residual = 0.083

Comparative Fit Indices
Comparative Fit Index = 0.904
Tucker–Lewis Index = 0.885
Incremental Fit Index = 0.906
Normed Fit Index = 0.821
[a]Relative Non-Centrality Fit Index = 0.785

Predictive Fit Indices
Akaike Information Criterion = 627.558
Expected Cross-Validation Index = 4.754

[b]**Parsimonious Fit Indices**
Parsimony-Adjusted – NFI = 0.684
Parsimony-Adjusted – CFI = 0.753

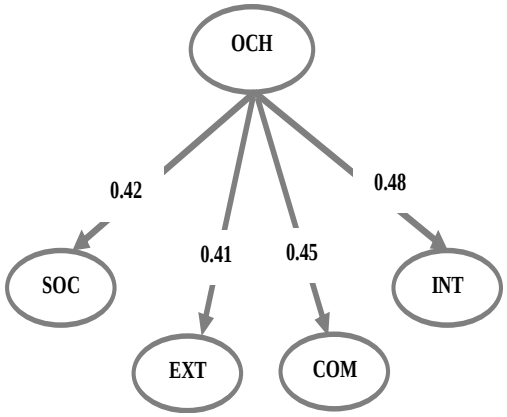


Figure 5.25: Path Estimates based on H6

Path	Gamma (γ)	[c]t – value	[d]p – value	Result
SOC ← OCH	0.42	4.51	.000	Strongly Supported
EXT ← OCH	0.41	4.35	.000	
COM ← OCH	0.45	4.77	.000	
INT ← OCH	0.48	5.02	.000	

[a]Similar to CFI but can be negative, therefore CFI better choice.
[b]Very sensitive to model size
[c]$t > 1.96$
[d]$p < 0.05$
Source: Hu and Bentler (1999), Browne et al., (1993), Carmines and McIver (1981)

Table 5.29 shows the standardised estimates under standardised regression weights and estimated values of squared multiple correlations (R^2). In the present model, the measurement portion of the model is relatively good (Bentler and Yuan, 1999). For example, SOC1 (.85), EXT3 (.85), COM4 (.86), INT1 (.84) and OCH2 (.84) represents the highest standardised regression weights. In contrast, SOC5 (.81), EXT7 (.80), COM6 (.75), INT7 (.68), and OCH5 (.72) has a lowest regression weights. Moreover, the corresponding R^2 values analogous to the regression weight

of each observed value also indicates the acceptable share of the variance within a respective factor. For example, EXT explain 51.8% (EXT3 ← EXT = $.72^2$) of variation in EXT3. It found that, all of the regression weights are significant enough thus each of survey items tapping information on their respective value dimension.

Table 5.29: Standardised Regression Weights and Squared Multiple Correlations (R^2)

Path	Regression Weights	Observed Variable	R^2 / SMC
OCH2 ← OCH	. 84	OCH2	.70
OCH3 ← OCH	.72	OCH3	.52
OCH4 ← OCH	.81	OCH4	.67
OCH5 ← OCH	.71	OCH5	.51
SOC1 ← SOC	.85	SOC1	.72
SOC2 ← SOC	.83	SCO2	.69
SOC3 ← SOC	.83	SOC3	.69
SOC4 ← SOC	.80	SOC4	.64
SOC5 ← SOC	.80	SOC5	.65
EXT1 ← EXT	.82	EXT1	.67
EXT2 ← EXT	.84	EXT2	.71
EXT3 ← EXT	.85	EXT3	.72
EXT5 ← EXT	.82	EXT5	.67
EXT7 ← EXT	.79	EXT7	.63
COM1 ← COM	.80	COM1	.65
COM2 ← COM	.80	COM2	.65
COM4 ← COM	.85	COM4	.73
COM5 ← COM	.79	COM5	.62
COM6 ← COM	.75	COM6	.56
INT1 ← INT	.83	INT1	.69
INT2 ← INT	.76	INT2	.57
INT4 ← INT	.81	INT3	.66
INT6 ← INT	.76	INT4	.58
INT7 ← INT	.68	INT7	.46

Independent Variable: CDT = Capability Development
Dependent Variable: SOC = Socialisation, EXT = Externalisation, COM = Combination and INT = Internalisation

Table 5.28 shows the model fit results of hypothesised model H6. The chi-square statistic showed no discrepancy from the perfect fit at the 5% significance level. It found that the chi-square value ($\chi 2 = 439.558$) indicates the fitness of this model with the population at cut-off probability ($p \leq 0.05$) level. In the similar vein, a ratio of chi-square to degree of freedom ($\chi 2/df = 439.558 / 230 = 1.91$) also indicate that the model is statistically significant at $p < .000$. In addition, the results of absolute fit indices, i.e. BCC = 671.558 and RMSEA = .078 also provided a marginally

acceptable fit for the hypothesised model. The comparative fit statistics demonstrated a good fit in all aspects as the estimated values, i.e. CFI = .904, TLI = .885, IFI = .906, NFI = .821 and RFI = .785 hanged behind the threshold limit. However, two predictive fit indices, AIC = 627.558 and ECVI = 4.754 also demonstrate a good fit to the data. Table 5.28 also summarised two parsimonious fit indices results. It found that the PNFI = .684 and PCFI = .753 indicated that the hypothesised model fits the data well.

H_6: Figure 5.25 illustrates the structural relationship amongst the exogenous (independent) and endogenous (dependent) variables. In this path analysis model, arrows go out of exogenous variable (OCH) and go into four endogenous variables (SOC, EXT, COM, and INT). As shown, structural relationship between organisational change and four knowledge creation process is significant at p-value < 0.05. The χ^2 statistic for model fit reveals that the model is a good fit to the data so that the null hypothesis can be rejected. In addition, the organisational culture factor had a significant impact on knowledge creation process. For example, the impact of organisational change on four knowledge creation modes (SOC ← OCH: $\gamma = 0.42$, t = 4.513, p-value < 0.01), (EXT ← OCH: $\gamma = 0.41$, t = 4.354, p-value < 0.01), (COM ← OCH: $\gamma = 0.45$, t = 4.771, p-value < 0.01) and (INT ← OCH: $\gamma = 0.48$, t = 5.021, p-value < 0.01) found to be significant.

5.18 Hypothesis H_7 – Organisational Learning & Knowledge Creation

As indicated, hypothesis H_7 based on the assumption that, organisational learning may be a factor of employee knowledge creation process within the context of commercial banks in Pakistan.

Table 5.30: Model Fit & Hypothesis Testing Results based on H_7

Absolute Fit Indices
Chi-square = 381.013
Degrees of freedom = 235
Ratio of $\chi 2$ to df = 1.621
Browne Cudeck Criterion = 600.601
Root Mean Square Residual = 0.069

Comparative Fit Indices
Comparative Fit Index = 0.937
Tucker–Lewis Index = 0.925
Incremental Fit Index = 0.938
Normed Fit Index = 0.852
[a]Relative Non-Centrality Fit Index = 0.826

Predictive Fit Indices
Akaike Information Criterion = 559.013
Expected Cross-Validation Index = 4.235

[b]**Parsimonious Fit Indices**
Parsimony-Adjusted – NFI = 0.726
Parsimony-Adjusted – CFI = 0.797

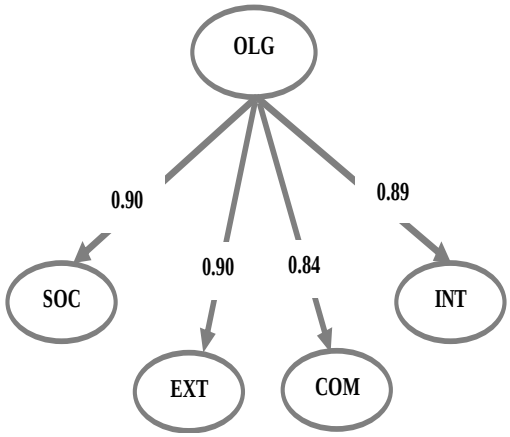


Figure 5.26: Path Estimates based on H7

Path	Gamma (γ)	[c]t – value	[d]p – value	Result
SOC ← OLG	0.90	9.57	.000	Strongly Supported
EXT ← OLG	0.90	9.36	.000	
COM ← OLG	0.84	8.47	.000	
INT ← OLG	0.89	9.17	.000	

[a]Similar to CFI but can be negative, therefore CFI better choice.
[b]Very sensitive to model size
[c]$t > 1.96$
[d]$p < 0.05$
Source: Hu and Bentler (1999), Browne et al., (1993), Carmines and McIver (1981)

Table 5.30 shows the standardised estimates under standardised regression weights and estimated values of squared multiple correlations (R^2). In the present model, the measurement portion of the model is relatively good (Bentler, 2000). For example, SOC1 (.85), EXT2 (.85), COM4 (.85), INT4 (.83) and OLG1 (.78) represents the highest standardised regression weights. In contrast, SOC2 (.75), EXT7 (.80), COM6 (.76), INT7 (.68) and OLG4 (.47) has a lowest regression weights. Additionally, the corresponding R^2 values of each observed variable indicates the reasonable portion of the variance within a respective factor. For example, OLG explain 27.0% (OLG3 ←

OLG = .52[2]) of variation in OLG3. It found that, all of the regression weights are significant enough thus each of survey items tapping information on their respective value dimension.

Table 5.31: Standardised Regression Weights and Squared Multiple Correlations (R^2)

Path	Regression Weights	Observed Variable	R^2 / SMC
OLG1 ← OLG	.77	OLG1	.60
OLG3 ← OLG	.72	OLG2	.52
OLG4 ← OLG	.68	OLG3	.46
OLG5 ← OLG	.77	OLG4	.59
SOC1 ← SOC	.85	SOC1	.72
SOC2 ← SOC	.75	SCO2	.56
SOC3 ← SOC	.79	SOC3	.63
SOC4 ← SOC	.77	SOC4	.60
SOC5 ← SOC	.78	SOC5	.62
EXT1 ← EXT	.82	EXT1	.68
EXT2 ← EXT	.85	EXT2	.72
EXT3 ← EXT	.83	EXT3	.69
EXT5 ← EXT	.81	EXT5	.66
EXT7 ← EXT	.80	EXT7	.64
COM1 ← COM	.80	COM1	.64
COM2 ← COM	.80	COM2	.64
COM4 ← COM	.85	COM4	.72
COM5 ← COM	.80	COM5	.65
COM6 ← COM	.75	COM6	.57
INT1 ← INT	.82	INT1	.68
INT2 ← INT	.76	INT2	.58
INT4 ← INT	.83	INT3	.69
INT6 ← INT	.76	INT4	.58
INT7 ← INT	.68	INT7	.46

Independent Variable: CDT = Capability Development
Dependent Variable: SOC = Socialisation, EXT = Externalisation, COM = Combination and INT = Internalisation

Table 5.30 shows the model fit results of hypothesised model H_7. The chi-squared statistic showed no discrepancy from the perfect fit at the 5% significance level. It found that the chi-square value ($\chi 2 = 381.013$) indicates that this model fits the data perfectly in the population at probability ($p \leq 0.05$) level. In the similar vein, a ratio of chi-square to degree of freedom ($\chi 2/df = 381.013 / 235 = 1.621$) also indicate that the model is statistically significant at $p < .000$. Additionally, the results of absolute fit indices, i.e. BCC = 600.601 and RMSEA = .069 also provided a marginally acceptable fit for the hypothesised model. The comparative fit statistics demonstrated a good fit in all aspects as the estimated values, i.e. CFI = .937, TLI = .925, IFI =

.938, NFI = .852 and RFI = .826 hanged behind the threshold limit. However, two predictive fit indices, AIC = 559.013 and ECVI = 4.235 also demonstrated a good fit to the data. Table 5.30 also presented two parsimonious fit indices results. It found that the PNFI = .726 and PCFI = .797 indicated that the hypothesised model fits the data well.

H_7: Figure 5.26 illustrates the structural relationship amongst the exogenous (independent) and endogenous (dependent) variables. In this path analysis model, arrows go out of exogenous variable (OLG) and go into four endogenous variables (SOC, EXT, COM, and INT). As shown, structural relationship between organisational learning and four knowledge creation modes is significant at p-value < 0.05. The χ^2 statistic for model fit reveals that the model is a good fit to the data so that the null hypothesis can be rejected. In addition, the organisational culture factor had a significant impact on knowledge creation process. The impact of organisational learning on four knowledge creation modes (SOC ← OLG: $\gamma = 0.90$, $t = 9.577$, p-value < 0.01), (EXT ← OLG: $\gamma = 0.90$, $t = 9.361$, p-value < 0.01), (COM ← OLG: $\gamma = 0.84$, $t = 8.474$, p-value < 0.01) and (INT ← OLG: $\gamma = 0.89$, $t = 9.174$, p-value < 0.01) found to be significant.

5.19 Hypothesis H8 – Strategic Direction & Intent and Knowledge Creation

As indicated, hypothesis H8 based on the assumption that, organisational strategic direction may be a factor of employee knowledge creation capability within the context of commercial banks in Pakistan. This over-identified model contains 406 data points and 109 parameters to be estimated with 227 degrees of freedom.

Table 5.32: Model Fit & Hypothesis Testing Results based on H8

Absolute Fit Indices
Chi-square = 479.532
Degrees of freedom = 227
Ratio of $\chi 2$ to df = 2.11
Browne Cudeck Criterion = 718.859
Root Mean Square Residual = 0.092

Comparative Fit Indices
Comparative Fit Index = 0.885
Tucker–Lewis Index = 0.861
Incremental Fit Index = 0.888
Normed Fit Index = 0.807
[a]Relative Non-Centrality Fit Index = 0.765

Predictive Fit Indices
Akaike Information Criterion = 673.532
Expected Cross-Validation Index = 5.103

[b]**Parsimonious Fit Indices**
Parsimony-Adjusted – NFI = 0.663
Parsimony-Adjusted – CFI = 0.728

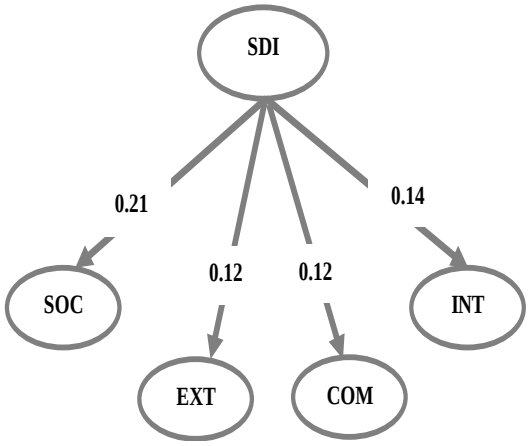


Figure 5.27: Path Estimates based on H8

Path	Gamma (γ)	[c]t – value	[d]p – value	Result
SOC ← SDI	0.21	1.47	.013	Not Supported
EXT ← SDI	0.12	1.40	.159	
COM ← SDI	0.12	1.51	.129	
INT ← SDI	0.14	1.70	.089	

[a]Similar to CFI but can be negative, therefore CFI better choice.
[b]Very sensitive to model size
[c]$t > 1.96$
[d]$p < 0.05$
Source: Hu and Bentler (1999), Browne et al., (1993), Carmines and McIver (1981)

Table 5.33 showed the standardised estimates under standardised regression weights and estimated values of squared multiple correlations (R^2). The measurement portion of the model is relatively good (Bentler and Yuan, 1999). For example, SOC1 (.86), EXT2 (.86), COM4 (.87), INT4 (.83) and SDI2 (.91) represent the highest standardised regression weights. In contrast, SOC4 (.80), EXT7 (.79), COM6 (.75), INT3 (.68) and SDI4 (.74) has a lowest regression weights. Additionally, R^2 value analogous to the regression weight of each observed variable also indicates the

acceptable portion of the variance within a respective factor. For example, INT explain 33.6% (INT6 ← INT = $.58^2$) of variation in INT6. In general, all of the regression weights are significant enough thus each of survey items tapping information on their respective value dimension.

Table 5.33: Standardised Regression Weights and Squared Multiple Correlations (R^2)

Path	Regression Weights	Observed Variable	R^2 / SMC
SDI1 ← SDI	.82	SDI1	.68
SDI2 ← SDI	.95	SDI2	.91
SDI3 ← SDI	.90	SDI3	.82
SDI4 ← SDI	.74	SDI4	.54
SOC1 ← SOC	.86	SOC1	.74
SOC2 ← SOC	.82	SCO2	.68
SOC3 ← SOC	.81	SOC3	.66
SOC4 ← SOC	.80	SOC4	.64
SOC5 ← SOC	.80	SOC5	.65
EXT1 ← EXT	.82	EXT1	.68
EXT2 ← EXT	.85	EXT2	.73
EXT3 ← EXT	.84	EXT3	.71
EXT5 ← EXT	.81	EXT5	.66
EXT7 ← EXT	.79	EXT7	.62
COM1 ← COM	.79	COM1	.63
COM2 ← COM	.80	COM2	.64
COM4 ← COM	.86	COM4	.75
COM5 ← COM	.80	COM5	.65
COM6 ← COM	.75	COM6	.56
INT1 ← INT	.82	INT1	.68
INT2 ← INT	.76	INT2	.58
INT4 ← INT	.82	INT3	.68
INT6 ← INT	.76	INT4	.58
INT7 ← INT	.68	INT7	.46

Independent Variable: CDT = Capability Development
Dependent Variable: SOC = Socialisation, EXT = Externalisation, COM = Combination and INT = Internalisation

Table 5.32 shows the model fit results of hypothesised model H_8. The chi-squared statistic showed no discrepancy from the perfect fit at the 5% significance level. It found that the chi-square value ($\chi 2 = 479.532$) indicates that this model fits the data perfectly in the population at probability level (p-value) less than 0.05. In the similar vein, a ratio of chi-square to degree of freedom ($\chi 2/df = 479.532 / 227 = 2.11$) also indicate that the model is statistically significant at $p < .000$. Additionally, the results of absolute fit indices, i.e., BCC = 718.859 and RMSEA = .077 also provided a marginally acceptable fit for the hypothesised model. The comparative fit statistics

demonstrated a good fit in all aspects as the estimated values, i.e., CFI = .885, TLI = .861, IFI = .888, NFI = .807 and RFI = .765 hanged behind the threshold limit. However, two predictive fit indices, AIC = 673.532 and ECVI = 5.103 also demonstrated a good fit to the data. Table 5.32 also presented two parsimonious fit indices results. It found that the PNFI = .663 and PCFI = .728 indicated that the hypothesised model fits the data well.

H_8: Figure 5.27 illustrates the structural relationship amongst the exogenous (independent) and endogenous (dependent) variables. In this path analysis model, arrows go out of exogenous variable (SDI) and go into four endogenous variables (SOC, EXT, COM, and INT). As shown, structural relationship between strategic direction and four knowledge creation modes is not significant at p-value < 0.05. The χ^2 statistic for model fit reveals that the model is a good fit to the data so that the null hypothesis cannot be rejected. In addition, the organisational culture factor had a significant impact on knowledge creation capability. The impact of capability development on four knowledge creation modes (SOC ← SDI: $\gamma = 0.21$, $t = 1.477$, p-value = 0.013), (EXT ← SDI: $\gamma = 0.12$, $t = 1.408$, p-value = 0.159), (COM ← SDI: $\gamma = 0.12$, $t = 1.517$, p-value = 0.129) and (INT ← SDI: $\gamma = 0.14$, $t = 1.700$, p-value = 0.089) found to be insignificant.

5.20 Hypothesis H9 – Organisation Goals & Objectives and Knowledge Creation

As indicated, hypothesis H9 based on the assumption that, goals & objectives may be a factor of employee knowledge creation capability within the context of commercial banks in Pakistan. This over-identified model contains 406 data points and 109 parameters to be estimated with 229 degrees of freedom.

Table 5.34: Model Fit & Hypothesis Testing Results based on H9

Absolute Fit Indices
Chi-square = 395.623
Degrees of freedom = 229
Ratio of $\chi 2$ to df = 1.727
Browne Cudeck Criterion = 630.016
Root Mean Square Residual = 0.074

Comparative Fit Indices
Comparative Fit Index = 0.917
Tucker–Lewis Index = 0.900
Incremental Fit Index = 0.919
Normed Fit Index = 0.826
[a]Relative Non-Centrality Fit Index = 0.790

Predictive Fit Indices
Akaike Information Criterion = 585.623
Expected Cross-Validation Index = 4.437

[b]**Parsimonious Fit Indices**
Parsimony-Adjusted – NFI = 0.685
Parsimony-Adjusted – CFI = 0.761

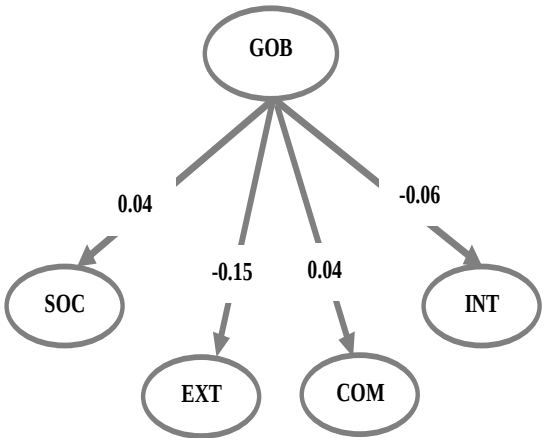


Figure 5.28: Path Estimates based on H9

Path	Gamma (γ)	[c]t – value	[d]p – value	Result
SOC ← GOB	0.04	0.45	.652	Not Supported
EXT ← GOB	-0.15	-1.670	.095	
COM ← GOB	0.04	0.584	.559	
INT ← GOB	-0.06	-0.766	.444	

[a]Similar to CFI but can be negative, therefore CFI better choice.
[b]Very sensitive to model size
[c]$t > 1.96$
[d]$p < 0.05$
Source: Hu and Bentler (1999), Browne et al., (1993), Carmines and McIver (1981)

Table 5.35 shows the standardised regression weights and estimated values of squared multiple correlations (R^2). In the present model, the measurement portion of the model is relatively good (Bentler and Yuan, 1999). For example, SOC2 (.86), EXT2 (.89), COM2 (.98), INT1 (.95) and GOB2 (1.01) represent the highest standardised regression weights. Alternatively, SOC4 (.78), EXT7 (.74), COM5 (.69), INT6 (.59), GOB4 (.625) and GOB4 (.352) has a lowest regression weights.

Additionally, R^2 value analogous to the regression weight of each observed variable indicates the respectable portion of the variance within a respective factor. For example, EXT explain 30.2% (EXT7 ← EXT = $.55^2$) of variation in EXT7. It found that, all of the regression weights are significant enough thus each of survey items tapping information on their respective value dimension.

Table 5.35: Standardised Regression Weights and Squared Multiple Correlations (R^2)

Path	Regression Weights	Observed Variable	R^2 / SMC
GOB1 ← GOB	.87	GOB1	.77
GOB2 ← GOB	1.0	GOB2	1.02
GOB3 ← GOB	.80	GOB3	.64
GOB5 ← GOB	.75	GOB5	.56
SOC1 ← SOC	.83	SOC1	.68
SOC2 ← SOC	.85	SCO2	.73
SOC3 ← SOC	.86	SOC3	.74
SOC4 ← SOC	.77	SOC4	.60
SOC5 ← SOC	.83	SOC5	.69
EXT1 ← EXT	.82	EXT1	.67
EXT2 ← EXT	.89	EXT2	.79
EXT3 ← EXT	.87	EXT3	.77
EXT5 ← EXT	.80	EXT5	.64
EXT7 ← EXT	.74	EXT7	.55
COM1 ← COM	.89	COM1	.79
COM2 ← COM	.97	COM2	.95
COM4 ← COM	.91	COM4	.84
COM5 ← COM	.68	COM5	.47
COM6 ← COM	.70	COM6	.49
INT1 ← INT	.94	INT1	.89
INT2 ← INT	.85	INT2	.72
INT4 ← INT	.78	INT3	.61
INT6 ← INT	.58	INT4	.34
INT7 ← INT	.62	INT7	.39

Independent Variable: CDT = Capability Development
Dependent Variable: SOC = Socialisation, EXT = Externalisation, COM = Combination and INT = Internalisation

Table 5.34 shows the model fit results of hypothesised model H_9. The chi-squared statistic showed no discrepancy from the perfect fit at the 5% significance level. It found that the chi-square value ($\chi 2 = 395.623$) indicates that this model fits the data perfectly in the population at probability level (p-value) less than 0.05. In the similar vein, a ratio of chi-square to degree of freedom ($\chi 2/df = 395.623 / 229 = 1.727$) also indicate that the model is statistically significant at *$p < .000$. Additionally, the

results of absolute fit indices, i.e. BCC = 630.016 and RMSEA = .074 also provided a marginally acceptable fit for the hypothesised model. The comparative fit statistics demonstrated a good fit in all aspects as the estimated values, i.e. CFI = .917, TLI = .900, IFI = .919, NFI = .826 and RFI = .790 hanged behind the threshold limit. However, two predictive fit indices, AIC = 585.623 and ECVI = 4.437 also demonstrated a good fit to the data. Table 5.34 also presented two parsimonious fit indices results. It found that the PNFI = .685 and PCFI = .761 indicated that the hypothesised model fits the data well.

H_9: Figure 5.28 illustrates the structural relationship amongst the exogenous (independent) and endogenous (dependent) variables. In this path analysis model, arrows go out of exogenous variable (GOB) and go into four endogenous variables (SOC, EXT, COM, and INT). As shown, structural relationship between goals and objectives and knowledge creation process is not supported at p-value < 0.05. The χ^2 statistic for model fit reveals that the model is a good fit to the data; however, null hypothesis might not be rejected. In addition, the organisational culture factor had no significant impact on knowledge creation process. The impact of goals and objectives on four knowledge creation modes (SOC ← GOB: $\gamma = 0.04$, t = 0.450, p-value = 0.652), (EXT ← GOB: $\gamma = -0.15$, t = -1.670, p-value = 0.095), (COM ← GOB: $\gamma = 0.04$, t = 0.584, p-value = 0.559) and (INT ← GOB: $\gamma = -0.06$, t = -0.766, p-value = 0.444) found to be insignificant.

5.21 Hypothesis H10 – Organisational Vision & Knowledge Creation

This over-identified model contains 300 data points and 109 parameters to be estimated with 235 degrees of freedom.

Table 5.36: Model Fit & Hypothesis Testing Results based on H10

Absolute Fit Indices
Chi-square = 576.961
Degrees of freedom = 235
Ratio of $\chi 2$ to df = 2.455
Browne Cudeck Criterion = 796.550
Root Mean Square Residual = 0.078

Comparative Fit Indices
Comparative Fit Index = 0.844
Tucker–Lewis Index = 0.801
Incremental Fit Index = 0.848
Normed Fit Index = 0.768
[a]Relative Non-Centrality Fit Index = 0.704

Predictive Fit Indices
Akaike Information Criterion = 754.961
Expected Cross-Validation Index = 5.719

[b]**Parsimonious Fit Indices**
Parsimony-Adjusted – NFI = 0.602
Parsimony-Adjusted – CFI = 0.661

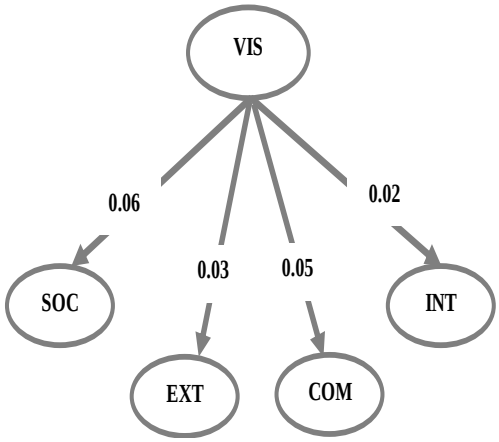


Figure 5.30: Path Estimates based on H10

Path	Gamma (γ)	[c]t – value	[d]p – value	Result
SOC ← VIS	0.06	0.763	.445	Not Supported
EXT ← VIS	0.03	0.352	.725	
COM ← VIS	0.05	0.652	.514	
INT ← VIS	0.02	0.194	.846	

[a]Similar to CFI but can be negative, therefore CFI better choice.
[b]Very sensitive to model size
[c]$t > 1.96$
[d]$p < 0.05$
Source: Hu and Bentler (1999), Browne et al., (1993), Carmines and McIver (1981)

Table 5.37 showed the standardised estimates under standardised regression weights and estimated values of squared multiple correlations (R^2). In the present model, the measurement portion of the model is relatively good (Bentler and Yuan, 1999). For example, SOC5 (.80), EXT5 (.81), COM4 (.84), INT1 (.84), VIS2 (.725) and VIS4 (1.04) represent the highest standardised regression weights. Alternatively, SOC1 (.71), EXT1 (.78), COM6 (.73), INT2 (.74) and VIS1 (.55) has a lowest regression weights. Additionally, R^2 value analogous to the regression weight of each observed variable also indicates the acceptable share of the variance within a respective factor. For example, VIS explain 60.8% (VIS2 ← VIS = $.78^2$) of variation in VIS2. It found

that, all of the regression weights are significant enough thus each of survey items tapping information on their respective value dimension.

Table 5.37: Standardised Regression Weights and Squared Multiple Correlations (R^2)

Path	Regression Weights	Observed Variable	R^2 / SMC
VIS1 ← VIS	.74	VIS1	.54
VIS2 ← VIS	.88	VIS2	.78
VIS4 ← VIS	1.04	VIS4	1.08
VIS5 ← VIS	.79	VIS5	.63
SOC1 ← SOC	.71	SOC1	.50
SOC2 ← SOC	.69	SCO2	.48
SOC3 ← SOC	.77	SOC3	.60
SOC4 ← SOC	.77	SOC4	.59
SOC5 ← SOC	.79	SOC5	.63
EXT1 ← EXT	.77	EXT1	.60
EXT2 ← EXT	.77	EXT2	.60
EXT3 ← EXT	.78	EXT3	.62
EXT5 ← EXT	.80	EXT5	.65
EXT7 ← EXT	.78	EXT7	.60
COM1 ← COM	.76	COM1	.58
COM2 ← COM	.79	COM2	.62
COM4 ← COM	.84	COM4	.71
COM5 ← COM	.80	COM5	.65
COM6 ← COM	.73	COM6	.53
INT1 ← INT	.83	INT1	.70
INT2 ← INT	.73	INT2	.54
INT4 ← INT	.80	INT3	.65
INT6 ← INT	.82	INT4	.67
INT7 ← INT	.82	INT7	.68

Independent Variable: CDT = Capability Development
Dependent Variable: SOC = Socialisation, EXT = Externalisation, COM = Combination and INT = Internalisation

Table 5.36 shows the model fit results of hypothesised model H_{10}. The chi-square statistic showed no discrepancy from the perfect fit at the 5% significance level. It found that the chi-square value ($\chi 2 = 576.961$) indicates that this model fits the data perfectly in the population at probability level (p-value) less than 0.05. In the similar vein, a ratio of chi-square to degree of freedom ($\chi 2/df = 576.961 / 235 = 2.455$) also indicate that the model is statistically significant at $p < .000$. Additionally, the results of absolute fit indices, i.e. BCC = 796.550 and RMSEA = .078 also provided a marginally acceptable fit for the hypothesised model. The comparative fit statistics demonstrated a good fit in all aspects as the estimated values, i.e. CFI = .844, TLI = .801, IFI = .848, NFI = .768 and RFI = .704 hanged behind the threshold limit.

However, two predictive fit indices, AIC = 754.961 and ECVI = 5.719 also demonstrated a good fit to the data. Table 5.36 also presented two parsimonious fit indices results. It found that the PNFI = .602 and PCFI = .661 indicated that the hypothesised model fits the data well.

H_{10}: Figure 5.30 illustrates the structural relationship amongst the exogenous (independent) and endogenous (dependent) variables. In this path analysis model, arrows go out of exogenous variable (VIS) and go into four endogenous variables (SOC, EXT, COM, and INT). As shown, structural relationship between organisational vision and four knowledge creation modes is not significant at p-value $<$ 0.05. The χ^2 statistic for model fit reveals that the model is a good fit; however, null hypothesis cannot be rejected. In addition, the organisational culture factor had no significant impact on knowledge creation process. The impact of organisational vision on four knowledge creation process (SOC ← VIS: $\gamma = 0.06$, $t = 0.763$, p-value = 0.445, (EXT ← VIS: $\gamma = 0.03$, $t = 0.352$, p-value = 0.725, (COM ← VIS: $\gamma = 0.05$, $t = 0.652$, p-value = 0.514 and (INT ← VIS: $\gamma = 0.02$, $t = 0.194$, p-value = 0.846) does not found significant.

5.22 Summary

The quantitative survey results of this study consist of three sequential phases. Firstly, both Cronbach's alpha reliability and uni-dimensionality analysis was performed for knowledge creation and organisational culture constructs in the pilot study (prior to data collection) phase and post-hoc scale development phase. For this purpose, the researcher initially specified the measurement model for each construct by processing the survey data (n = 131) in IBM AMOS v19 with the maximum likelihood estimation method. However, the initial measurement model contained a low factor loading and corresponding square multiple correlation results in the uni-dimensionality analysis. Therefore, eight items in the knowledge creation construct and twelve items in the organisational culture construct were removed and re-specified measurement model ran with the rest of the items that were generated in the initial model.

Secondly, in order to verify the theory and to assess the latency in the constructs, CFA was used in the second phase. The CFA was used to assess whether or not a hypothetical model developed by a researcher denoted as Σ (θ) can better represent the population denoted as Σ (i.e. Σ (θ) = Σ). In this process, the validity of the scale has been established in the pilot study (prior to data collection) phase and post-hoc scale development phase. In the pilot testing phase, face and content validity are measured whereas in the post-hoc scale development phase, composite validity (CV) and discriminate validity (DV) are measured using the confirmatory factor analysis approach.

Table 5.38: Summary of Hypothesis Testing Result

Organisational Culture			Tacit Knowledge		Explicit Knowledge	
			S	E	C	I
Internally Focused	Involvement	Empowerment	+	+	+	+
		Team orientation	+	+	+	+
		Capability Development	+	+	+	+
	Consistency	Core Values	+	+	+	+
		Coordination Integration	+	+	+	+
Externally Focused	Adaptability	Organisational Change	+	+	+	+
		Organisational Learning	+	+	+	+
	Mission	Strategic Direction	-	-	-	-
		Goal and Objective	-	-	-	-
		Vision	-	-	-	-

Thirdly, in order to see the hypotheses' relationships of H1, H2, H3… H10 among endogenous and exogenous variables, a structural equation modelling (path analysis) was used in the hypotheses' testing phase. In order to see the adequacy of the hypothesised relationship, different model fit outcomes such as: i) compare and contrast different model fit indices; ii) significance of the estimated paths between hypothesised latent variables for measuring a best fitting model on the basis of theoretical foundation; iii) squared multiple correlations (SMC) for strength of the hypothesised relationship and amount of variance in each endogenous latent variable;

iv) magnitude of the estimated parameters; and v) measurement error of survey data were thoroughly assessed.

In order to understand the complex relationship between organisational culture and knowledge creation process in knowledge-intensive banks in Pakistan, a theoretical framework has been developed and ten hypotheses have been drawn on the nature and direction of these relationships. The impact of the three indexes in organisational mission culture on four knowledge creation modes were found to be insignificant and negative. However, the result of the rest of the three organisational culture variables (involvement, consistency, and adaptability) on knowledge creation modes are confirmed as the most powerful effect in the model. Subsequently, three (H8, H9, and H10) of the ten hypotheses are rejected in this analysis with two from the remaining seven partially supported.

In the next section, the quantitative analysis results are now triangulated with the qualitative interview findings to assess the efficacy of the relationship, and they will complete the requirements of a mixed-method research design. The theoretical and practical implications of both qualitative and quantitative data strands are compared and contrasted in the discussion for further examination in future research. The next chapter covers the qualitative data analysis in order to access this depth of understanding.

CHAPTER 6

QUALITATIVE DATA ANALYSIS

6.1 Introduction

Although, a qualitative strand of this quantitative-driven mixed-methods study is designed to investigate the core issues related to the policy framework of Pakistani commercial banks from knowledge management strategy perspective, the qualitative strand used for data integration and comparing the separate results depending on the nature of the data and use (Saunders et al., 2011). In addition, the results derived in the quantitative analysis also showed some unwanted problems with the hypothetical relationships. Some of the factor loadings within H_8, H_9 and H_{10} during the CFA model fit were dissimilar to the expectation. For instance, organisational vision, corporate strategy and organisational goals and objectives showed a negative relationship with knowledge creation process in Pakistani banks. It further turned out that the organisational culture of the banks does not allow members to use newly learned knowledge as a source of next time application that could have many implications. Therefore, the purpose of qualitative information is to probe the quantitative results in more detail and to seek an opinion from senior management regarding knowledge management implementation and use in the banks.

Meanwhile, interviewing is one of the most important tools of data collection so as to be familiar with participants' perception, belief and behaviour (Creswell, 2013; Guthrie, 2010). As indicated in Chapter 4, a mixed-methods research design (see Section 4.6) that combines both quantitative and qualitative approaches adopted as a research methodology in this study. Therefore, the both quantitative and qualitative data sets compared and contrasted in such a way that links the qualitative data analysis categories against quantitative data analysis. The flow diagram illustrated in the Figure 6.1 shows a probable link between qualitative data analysis categories against quantitative data analysis. For example, the qualitative analysis category i.e. knowledge strategy linked with the quantitative data analysis i.e. knowledge socialisation and work environment linked with knowledge externalisation.

In Chapters 5 and 3, the author covered the quantitative study of this thesis including the variable identification, hypothesis development, research design, data collection process and hypothesis testing during the CFA model fit using the IBM AMOS v19. In this chapter, the procedure of a qualitative data analysis has been explained. Moreover, the objective of this chapter is to explain the way through which participants accessed, conducted interviews and qualitative information obtained. Also, it summarises how and why an inductive content analysis used for the purpose of the qualitative data analysis. Besides this, the chapter also includes the specifics of the process of qualitative content analysis using Nvivo.

Figure 6.1 Link between Qualitative Data Analysis Categories and Quantitative Data Analysis

Knowledge Strategy - Team Orientation – Co-ordination and Integration ➔ Knowledge Socialisation

Work Environment - Technology Infrastructure ➔ Knowledge Externalisation

Organisational Involvement - Technology Infrastructure ➔ Knowledge Combination

Organisational Change - Organisational Learning – Capability Development ➔ Knowledge Internalisation

6.2 Semi-Structured Interview Guide

As has been mentioned in Chapter 3, the mixed-methods research question of this study was: how does organisational culture affect the knowledge creation process? In order to address the qualitative strand of the mixed-methods research question, the qualitative question (i.e. how does the senior management promote knowledge creation and sharing culture in Pakistani banks?) answered qualitatively during semi-structured interviews at senior level management level. The qualitative data from the purposely-selected senior level managers looked to clarify a more comprehensive picture at the effects of organisational culture that may be conducive in creating and managing new knowledge in the banks. More specifically, using key informants in organisation for collecting qualitative information is valuable for investigating social, organisational or cultural upbringing of underlying phenomenon and unfolding people accepted wisdom towards any issue or problem (Guthrie, 2010 and Creswell, 2013). Therefore, the purposely-selected senior level respondents (see Section 4.8)

also considerable in order to reduce information and motivation bias associated with different hierarchical levels (Doty et al., 1993).

Table 6.1: Semi-Structured Interview Guide

Personal Information
What position do you hold within this bank?
Leads

- What are your main functions of the job?
- How long have you been working in current organisation?
- How long have you been working at your current position?

Knowledge Strategy
How management policies affect employees in expressing what he/she has in mind and what they are saying? Can you provide an example?
Leads

- Do you encourage knowledge exploration (i.e., finding new knowledge resource)?
- Do you encourage knowledge exploitation (i.e., leveraging existing knowledge resource)?
- Is your organisation creating an effective new knowledge from people interaction?
- Is your bank up-dating and developing new knowledge processes for innovations?
- Is your bank integrating knowledge in the organisation business activities?

Leadership Support and Organisational Culture
How does leadership encourage employees to create a knowledge culture? Can you provide example?
Leads

- How you would characterise the culture of your bank?
- Which cultural value do you consider as most important for encouraging the employees to create a knowledge culture?
- How does leadership encourage employees to participate in the establishment of their goals and performance objectives?

Work Environment
Do you provide a work environment in which employees are engaged, challenged, motivated and rewarded?
Leads

- Do you promote teamwork in the bank?
- Do you promote workplace socialisation between employees?
- How are individual ideas brought forward and evaluated?
- Do you provide an I.T. platform that may enhance the efforts of the employees to create and share knowledge?

Knowledge Accessibility
Is knowledge accessible to everyone in your bank?
Leads:

- How do organisational members communicate formally (e.g., group discussion, meetings, seminars, workshops etc)?
- How do organisational members communicate informally?
- In your opinion what are the main cultural barriers to achieve a required knowledge for performing task or activities?

The qualitative survey allow researchers to add further interpretation to the quantitative findings of a given context and underlying phenomenon through

complete descriptions (Denzin and Lincoln, 2005). Therefore, the qualitative method of data collection employed for clarification of the results and communication between people and things interrelated to the phenomenon under consideration (Saunders et al., 2011). In case of this study, the semi-structured interview questions particularly designed to consider the main themes highlighted by the literature and brought together in the theoretical framework. For this, an effective interview guide consists of the list of questions that covers all sub-topics of interest taken from the quantitative survey, rephrased, and rearranged according to the sequence of the topic, so the questions covered the same topic. Likewise, the qualitative data mainly rooted in interpretive methodological principle (Bryman, 2004). Therefore, the qualitative interviews facilitate to unfold new topics in more detail and allowed researcher to understand and interpret senior managers' understanding with organisational culture and knowledge management initiatives in the Pakistani banks.

Besides this, variables used in the quantitative study also considered during designing interview questions for two reasons. Firstly, it helps researcher to capture desired information related to the knowledge management implementation and use from a senior management perspective. Secondly, it helps to integrate the qualitative and quantitative results on the established frameworks of organisational culture and the knowledge creation domain. However, the semi-structured interview questions used in the qualitative survey particularly designed to consider the main themes highlighted in the literature. In view of that, the interview guide was categorised according to the key elements of knowledge management implementation and use mainly based on the work of Nonaka et al. (2006) and Jashapara (2005). As shown (see Table 6.1) in the interview guide, the researcher asked twenty-four questions under six categories according to the key elements of knowledge management in the banks. For example, the knowledge creation requires 'knowledge strategy' i.e. the management policies that affect knowledge exploration and knowledge exploitation in the organisation (Jashapara, 2005). Therefore, the researcher asked five questions under this category mainly covers the identical ways through which new knowledge resources can be explored and existing knowledge resources can be leveraged. The knowledge creation process also requires leadership encouragement that supports a

knowledge culture (Nonaka et al., 2006). Thus, the researcher included four lead questions under leadership support and organisational culture category mainly asked to distinguish the cultural value as most important in terms of employee encouragement to create a knowledge culture in the banks.

The physical environment of an organisation also acknowledged as a facilitator for knowledge capture and sharing. The senior management also required to provide a work environment in which an informal dialogue between staff can be prevailed (Jashapara, 2005). This category included four lead questions to ascertain a work environment that promotes teamwork in the bank, support workplace socialisation between employees and provide a platform that may enhance the efforts of the employees to create and share knowledge. However, in the last category of knowledge accessibility, the researcher asked some question regarding knowledge accessibility in the banks. The purpose of this category is to identify the main cultural barriers to achieve a required knowledge for performing tasks or activities in banks (Nonaka et al., 2006). In addition, the interview questions asked in such a way that the respondent feels no hesitation and talk freely about the subject, but to the point and according to the interest of the researcher. There is still possibility to change the sequence of the questions to probe for more information. However, the researchers can foreknow the next question in the sequence flowed naturally based on the previous answer during interview.

6.3 Qualitative Data Analysis Procedure

In qualitative research, managing and analysing qualitative data is an irksome job (Ishak and Bakar, 2012). Sometimes, it tends to be complex when researchers are dealing with unstructured or off the point information. In spite of this, notable researchers, for example, Bazeley (2009) and Richards (2002) suggested that the qualitative data can generate evocative findings with proper management. In the social science literature, three approaches to qualitative data analysis have been broadly discussed such as, "literal", "interpretive", and "reflexive" (Mason, 1996; Miles and Huberman, 1994 and Silverman, 2013). In this study, findings derived from the content analysis of 07 semi-structured interviews taken from the senior

management of 03 banks in Karachi. Out of seven interviews the findings of the first interview used as a pilot study in order to develop interview questions and test the interview schedule. A qualitative analysis of 06 semi-structured interviews of this quantitative driven mixed-methods study involves rigorous analytical process based on the qualitative content analysis method for making replicable and valid inferences from data in their context. Following to the semi-grounded approach instead of purely grounded theory, qualitative content analysis can be used with the purpose of knowledge from subjects reflecting how they view the social world (Krippendorff, 1980).

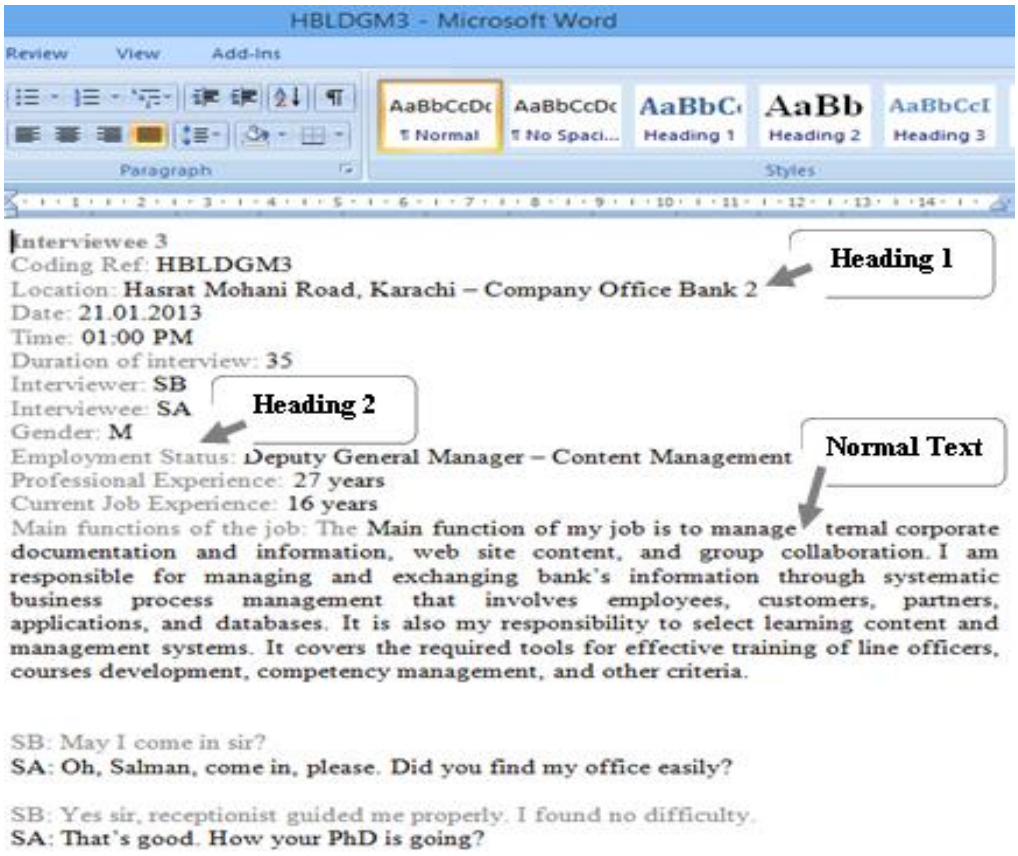
The process of content analysis explained in a different way across the qualitative research literature. However, depending on the objective of this study, a conventional qualitative content analysis technique can be used in which coding categories extracted from the data inductively (Elo and Kyngas, 2008). Following to suggestions of Patton (2005) and Berg (2004), the content analysis method employed to condense (reduce) the raw data into themes based on a valid inference and interpretation. In case of this study, the qualitative content analysis used because it permits grounded theory process based on the 'epistemological relativist assumption' by allowing only what can be categorised from the raw data, inferences drawn from themes and generate theory (Elo and Kyngas, 2008; Hsieh and Shannon, 2005).

Also, qualitative content analysis favoured over other approaches because of subjective interpretation of the purposely selected text data through systematic process of coding (Hsieh and Shannon, 2005). The process of inductive content analysis begins with the organisation of the qualitative data, open coding, creating categories and abstraction (Elo and Kyngas, 2008). However, in order to deal with the huge amount of data at one point in time, the researcher used computer assisted qualitative data analysis software (CAQDAS) for many useful [12] features. For

[12] a) Data Management: All the data can be properly organised and managed in the separate folders according to the type. b) Data Integration: Primary and secondary data (collected data and literature review) can be arranged in a likely manner and integrate it for better analysis. c) Data Importing: Any type of data such as, video, audio or MS word file can easily be imported as data source. d) Data Coding: Coding stripes in the margins of each document help better utilising of codes. e) Coding Comparability

example, it simplifies data management and data analysis process without reducing the quality of the qualitative research (Bazeley, 2009). The decision of using Nvivo taken on the basis of its prominent features and relatively simple use in managing and analysing non-numerical data ([13]QSR International). It argued that, Nvivo not only used in theory testing, but it also identifies patterns and eases the complexity in the research process (Ishak and Bakar, 2012). In addition, Nvivo can be used with a large range of research methodologies, for example, literature review, grounded theory, phenomenology, conversation analysis, ethnography, and mixed-methods research.

Figure 6.2: Process of Developing Documents



After making the decision of using a computer assisted qualitative data analysis software (CAQDAS) for qualitative data analysis, the immediate next step was to establish the appropriate procedure of qualitative data analysis. Since, qualitative analysts appeared to be dispersed on the procedure of qualitative data analysis using

[13]http://www.qsrinternational.com/default.aspx

computer assisted software. For example, the related literature revealed two schools of thoughts with different approaches. In this regards, first school of thought follow the grounded theory approach to data analysis while the other overlooks the use of grounded theory approach using Nvivo. The proponents of the grounded theory approach argued that the qualitative data analysis software facilitates theory building from the data, so it is based on grounded theory. Because, in a grounded theory approach theory emerged from the data. In contrast, Welsh (2002, p.3) refuted this argument and stated that "Nvivo software drive the researcher to draw theory from the data thus it is not necessary to follow the grounded theory guidelines when using Nvivo software".

In this study, interview transcripts were analysed using Nvivo based on the four steps: coding, continuous comparison, weighting of the evidence and triangulation. However, the process of qualitative content analysis using Nvivo used by Ishak and Bakar (2012) comprised of following consecutive stages: i) semi-structured interviews document development ii) developing folder and importing documents iii) coding of variables through nodes iv) and developing categories for data queries.

6.3.1 Document Development for Semi-Structured Interviews

The semi-structure interviews were conducted in the Urdu and English languages. For the purpose of analysis, they were translated, transcribed and coded into English. As shown in figure 6.2, the qualitative data was manually transcribed and corrected using Microsoft office word 2013 before it was imported into the Nvivo software. The manual transcription allows researcher to manage relatively small qualitative information in an orderly manner. For this purpose, the seven interview transcripts were saved under (*.docx) type of file in a separate folder.

As shown in Figure 6.2, the first paragraph of the document under Heading 1 contained personal information of the interviewees such as job title, job functions and job experience. It found that the respondents usually avoid sharing personal information like age, experience and qualification. Therefore, the researcher asked only essential details in order to corroborate their involvement in the policy

formulation and strategic decision making process. In this regard, details about the main functions of the job will be helpful when researcher wants to examine the underlying phenomenon in detail. In addition, the written information divided into right and left sides of the (*docx.) file. In the right hand side, the status of the interviewer or interviewee was mentioned, while the left hand side contained the transcribed note. For the sake of confidentiality, the researcher used codes such as, NBPHR1, HBLDGM3 and MCBHR4 instead of mentioning the names of each interviewer. As shown, the separate headings assigned to right hand side information for the purpose of analysis in the Nvivo. Finally, the document was saved under coded name, for example, NBPHR1 *.docx.

6.3.2 Developing Folder and Importing Documents

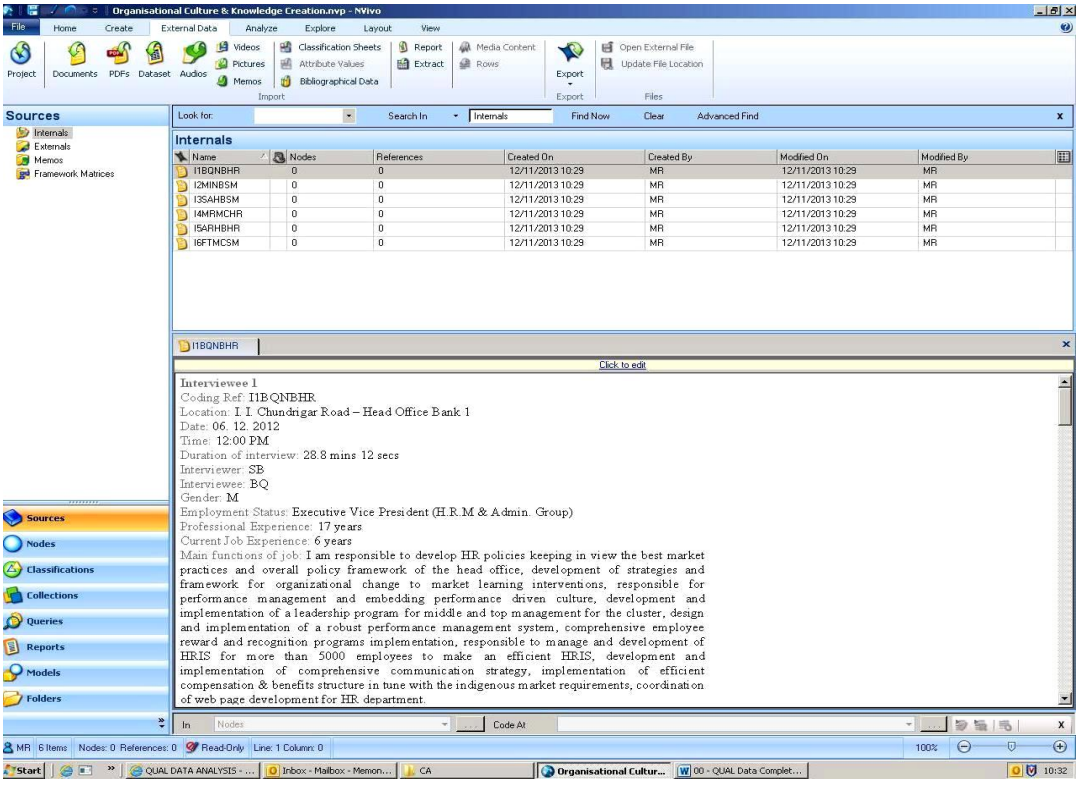
The second step of the qualitative data analysis procedure is development of the folder and importing word files of each interviewee directly into the folder for proper management. For this purpose, the researcher created a separate folder for interviews. Simultaneously, all the word files were imported directly into this folder. Since, this folder was saved in the sources which can be seen in the Navigation View of the Nvivo software. After ensuring that the each document imported under respective folder, the next step was whether or not the text information provided in the documents captured appropriately. Since, Nvivo permits researchers to capture required information within the document. For example, the first command (i.e. Text Option ➔ Create Description) helped the researcher in order to capture the first paragraph of the document that contains personal information of each interviewee. In a similar vein, the second command (i.e. Options ➔ Code sources at new cases located under) allows the researcher to examine the interviewee-interviewer conversation in more detail. Figure 6.3 is a quick screen capture of document management and capture process.

6.3.3 Coding and Mapping of Variables through Nodes

In general, coding is the systematic process of assigning codes (or labels) to the qualitative data that may be available in the form of paragraphs, sentences, phrases and words. According to Welsh (2002), it is a process of developing categories,

themes, and concepts in order to get answers from main research questions. Since, there are numerous methods (e.g. ‘open’, ‘axial’, ‘hierarchical’ or ‘non-hierarchical’) to apply coding depending upon the research methods and amount of data. Following to guidelines of Ishak and Bakar (2012) the Nvivo software was used for assigning codes to all primary qualitative data generated through interview transcripts.

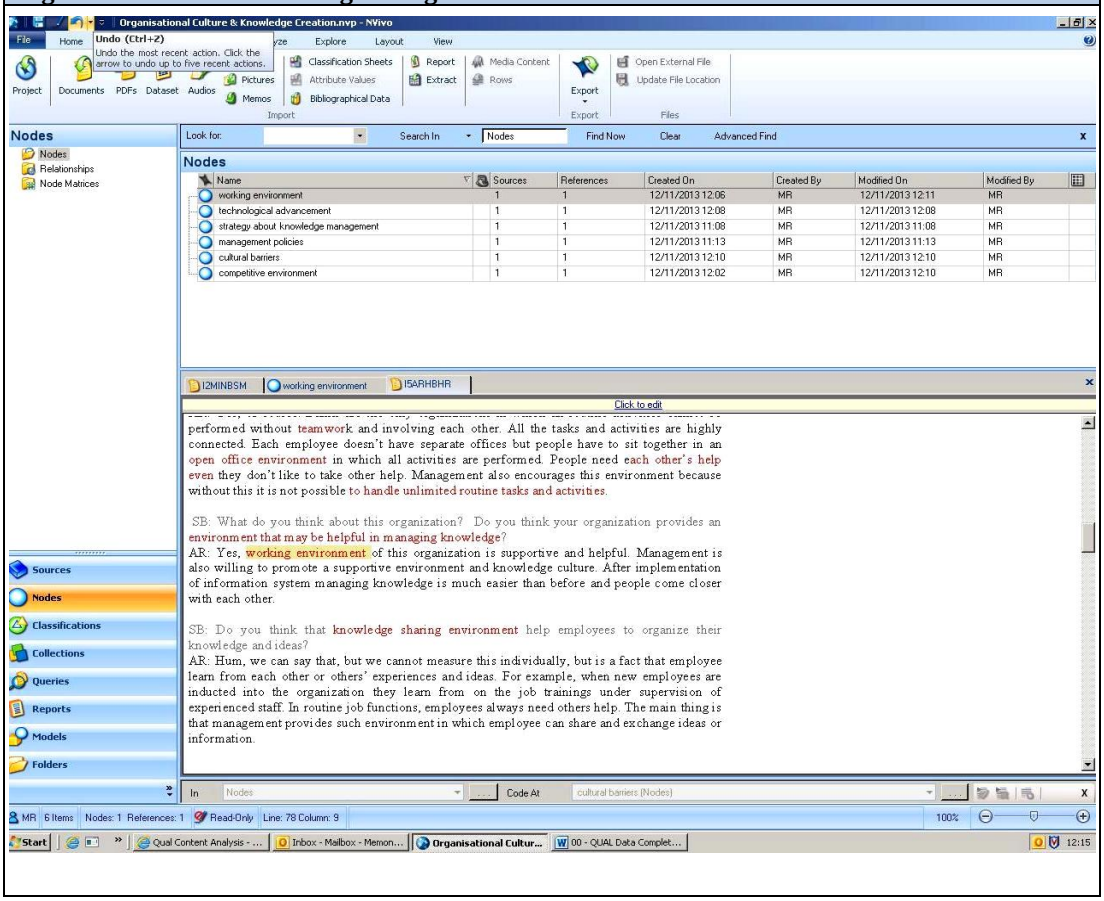
Figure 6.3: Process of Developing of Folders and Importing Documents



Specifically, variables represent the idea, concept, people, places or processes. Therefore, research variables are coded at nodes that represent variables (Ishak and Bakar, 2012; Welsh, 2002). The node neither capture general theme nor create any sense about the text because these are unconnected ideas. However, nodes can only capture the general themes and connect ideas through coding or mapping variables into categories. Since, coding used for putting data into themes while different categories, for example, tree nodes (i.e. which are stand-alone) and free nodes (i.e. which have sub nodes) used to store all relevant text so that researchers can read, compare, contrast and analyse the data (Ishak and Bakar, 2012; Welsh, 2002). Practically, text stored first in the free nodes and then moved into tree nodes. Therefore, free nodes are particularly useful because it splits broader categories into

different sub-categories under the broad headings. It allows investigation of the data and evaluates the differences or similarities. Since, tree nodes can only be developed on the basis of a theoretical framework utilised by the researcher as it is most concrete process of nodes. According to Cassell et al. (2006), tree nodes present a big picture of the categories by establishing an important relationship and maintaining the overall perspective.

Figure 6.4: Process of Coding through Nodes



As noted before, coding was done through Nvivo to identify particular themes from the data in relation to knowledge management implementation and use in the banks. For this, initial text was outlined on the basis of main research objective and interview guide outlined by the researcher. Following to the Johnson et al. (2007) main categories were drawn from primary data and their interrelationships were inductively created. Coding was applied using hierarchical coding methods. It is a method of assigning codes in a hierarchical arrangement. For example, codes first assign into a generic category and then each generic category further assign sub-categories just like tree and branching arrangement (Ishak and Bakar, 2012; Johnson

et al., 2007; King et al., 2004 and Welsh, 2002). Therefore, all main, generic and sub-categories directly developed during the abstraction process during inductive content analysis of this study. Since, each main category further grouped into generic categories which are further classified into sub-categories.

6.4 Qualitative Data Analysis

The following section summarises the results and analyses of six interviews. It contains a descriptive details and explicatory examples from the interview transcripts (Johnson et al., 2007). Moreover, in order to attain a certain level of theoretical abstraction, both literature and evidence from the interviews are triangulated and are used in the discussion (see Chapter 7). The subsequent section briefly outlines the qualitative data analysis of each interview. In some cases, verbatim quotes are provided in an italic format.

6.4.1 Knowledge Strategy

The impact of knowledge strategy plays a pervasive role in the long-term institutional development of the organisation. The respondents mentioned that the privatisation has changed the organisational culture in different direction. For example, the major focus has been shifted towards long-term institutional growth and development rather than profitability and financial growth. The senior manager stated that the privatisation has triggered the competition among the banks to upgrade their technology platform by introducing online banking service and e-banking facility.

> *'... after privatisation in 2005, the major focus was long-term institutional development. At that time, various important initiatives had been taken such as creating an automated system and an online networking of branches. Also, the banks have implemented a management information system and an upgraded technology platform…'*
>
> *(NBPRH2)*

An interviewee also added that:

> *'...in my opinion, the main benefit of privatisation was to increase the competition among the banks, which would create more opportunities in terms of employee career growth on the basis of their learning and development...'*
>
> *(MCBSVP6)*

The knowledge accessibility and flow in the organisation is also one of the important requirements of knowledge creation. It requires that the members of all cadres and ranks must have a free and easy access to corporate information (or databases) via information technology. In terms of knowledge creation and transfer in the banks, a senior manager replied that employees are responsible for following business ethics and practice during preparation of their operational plans. For this, they have access to important information regarding banking policy, rules and procedures. The idea was reinforced by a senior manager:

> *'...management policies are clearly stated and communicated to all the employees. However, they are least empowered with decision power because they have to make operational plans according to the ethics and business practice of the bank...'*
>
> *(NBPHR1)*

The qualitative result also identified the way through which knowledge strategy indulges in the knowledge culture through learning-based career growth within the case organisation. In this regard, organisational learning was found to be a source of knowledge creation under the supportive organisational and societal conditions for knowledge management initiatives in the banking firms. In the case of Pakistani banks, training and development aimed to be a substantial instrument for helping the management to build a knowledge culture. After privatisation, leading banking groups invested intensively in the training and development of the employees, and it

turned into a core organisational strategy. For example, a deputy general manager said that:

> *'... to be very honest, this organisation promotes the culture of learning and development in the organisation since day one. The senior management is not double-minded and they do not have double standards in terms of employees learning, career growth and development. The management does not want employees to achieve assigned targets only, but they are looking at how much they grow through learning and development. We are spending an unlimited budget for employees' training, higher education and career development plans…'*
>
> *(HBLDGM3)*

In terms of training and development, different pre-service and on-the-job training programmes are used as a part of the strategy for promoting knowledge culture in the banks. All respondents agreed that the bank provides necessary training for recuperating vocational and job skills to the employees.

> *'…the senior management believes that if the wrong person is selected for a job, then he/she will become a permanent loss to the organisation. Therefore, we are providing maximum possible training opportunities to our staff. For this, we have our own staff colleges in which newly appointed candidates receive nine months pre-service training. On the successful completion of the training programme, they are appointed an officer grade III. We have also a complete procedure of on-the-job training programmes in which participation of every employee is compulsory…'*
>
> *(NBPHR1)*

In spite of the training and development as a part of the strategy for promoting knowledge culture in the banks, the qualitative interview finding also revealed a lack

of distinct knowledge strategies, specified knowledge goals, and organisational knowledge vision that facilitates changes in the organisational culture, cultural values and employee beliefs for managing knowledge. For instance, the regional head of one of the leading banks responded that they are dealing with knowledge management as a part of human resource strategy. They do not have any separate policy documents that portray the process of managing tacit and explicit knowledge in the banks. The regional head responded that:

> *'...this organisation deals with knowledge management as a part of the human resource strategy. The HR department deals with employee training and learning and all this is done in the human resource department…'*
>
> *(NBPRH2)*

The current banking reforms in the basic organisational structure together with knowledge management system development supports the process of managing explicit knowledge in the banks. However, the qualitative interview finding indicated the absence of separate positions (e.g. chief knowledge officer, knowledge analyst, knowledge manager and knowledge engineer) in the conventional hierarchy of Pakistani banks to handle knowledge management issues. It implies that the knowledge management function in Pakistani banks is merely treated as a function of the human resources department (HRD) and the entire knowledge management process overlaps with organisational learning and development processes that may have no tendency towards managing explicit and tacit knowledge as a strategic asset of the organisation. For example, a senior vice-president said that:

> *'...actually, we don't have a separate designated position of chief knowledge officer, but we have our own designated positions perform these functions like a general manager, deputy general manager, and senior manager...'*
>
> *(MCBSVP6)*

The culture of knowledge sharing and transfer cannot be flourished without management support and supportive organisational conditions. For this, specific policy or mechanism that encourages knowledge management activities is vital for knowledge sharing between groups and departments across the organisational structure. Instead, banks have a highly hierarchical organisational structure, employee involvement and participation on important issues. Therefore, the relentless feedback system seemed to be useful in promoting knowledge sharing and transfer in the banks. In case of this organisation, the senior manager explained that:

> *'…branches are required to meet the functional responsibilities and if they face any issues they can share their opinions. Most of the time management change policies on this feedback. The management usually shows flexibility, a member or employee is within his/her right to suggest what they think could be done to improve or amend some policies...'*
>
> *(NBPHR1)*

Friendly culture, meritocracy, performance-based reward system: these features are all factors in an employee knowledge creation. But, a qualitative survey of this study revealed that the performance monitoring a feedback system is a vital tool for promoting knowledge culture in the banks. According to the senior HR head:

> *'…management encourages open communication between employees. Employees have a voice in the decisions, and they can share opinions, there is no restriction. If someone thinks that their feedback could be used to improve the things in some way, then they can participate…'*
>
> *(NBPHR1)*

The knowledge transfer during a two-way dialogue between employees and managers is an appropriate way to understand what is required and how it could be achieved. The collectivism in the banking culture helps members to build strong,

cohesive groups, and support the process of knowledge creation in the banks. A senior manager pointed out that:

> *'...on daily issues, working staff and managers are normally talking freely. Dialogue between employees and customers are also encouraged and there is no such restriction on employees on knowledge sharing and exchange...'*
>
> *(NBPHR1)*

Summary: The findings presented above indicate that privatisation has changed the organisational culture of the Pakistani banks in a completely different direction. The advancement in the technology platform helped banks to explore new knowledge resources through knowledge sharing and transfer of important information regarding banking policy, rules and procedures. However, the absence of separate positions to handle knowledge management functions in the conventional hierarchy of Pakistani banks also indicates the lack of the mechanism of integrating knowledge in different banking activities. In conclusion, the present knowledge strategy of Pakistani banks is more focused on knowledge exploration through organisational learning; but do not concentrate on knowledge exploitation through developing new knowledge processes for innovations and integrating knowledge in the organisational business activities.

6.4.2 Organisational Culture and Management Support

The first generic category that emerged from organisational culture and management support was leadership encouragement. However, during an inductive content analysis, another three sub-categories (teamwork, achievement, and growth opportunities) were derived from this generic category. It revealed that management supports and promotes teamwork and produces growth opportunities. According to a senior human resource manager:

> *'...management encourages teamwork and achievement. Good performers have excellent growth opportunities in the organisation.*

But, it is not possible to maintain the same standard if you are handling a network of more than a thousand branches. Sometimes, we receive complaints from our employees about unfair practices from middle management at branch level but it depends on the individual and manager of that branch...'

(NBPHR1)

The sturdy organisational culture and supportive environment plays a significant role in deploying tacit knowledge through continuous social interaction in the open offices, departments, meetings, and training programmes. In the case of the Pakistani banks, the open work space facilitates members to interact and share information. A senior human resources manager replied that:

'...culture of this organisation is supportive and helpful. We have an open office environment throughout the branches in which all banking operations are performed. Only managers have separate glass cabins but these are also open and employees can interact with each other at any time...'

(HBLHR5)

Apart from an open office environment and supportive workspace, the information system of the bank has seized the remoteness between workers and managing knowledge is much easier than before. For instance, the senior human resources manager suggested that:

'...I think information technology is good for managing information in daily activities because it is easy to handle than before...'

(HBLHR5)

In terms of banking culture, the major difference that was identified between pre- and post-privatisation era there was management encouragement and support for

employees to participate in the establishment of their goals and performance objectives. In spite of centralised decision making in Pakistani banks, some of the operational level decision making and planning was delegated to regional and divisional level. According to a senior human resources manager:

> *'...you know, banks are highly centralised organisations and decision making is mainly done at the top level of the management structure. Before privatisation, managers were least empowered with decision powers. But, this is not the case now because most of the operational level planning and decision making is also intended at regional and divisional offices. Managers have complete authority to decide what their objectives are and this is in accordance to changing supply and demand conditions in their areas....'*
>
> *(NBPHR1)*

In addition, the impact of management support was also evident in the management flexibility during assigning goals and performance objectives. It helps employees to keep their focus on the performance outcomes. For example, a senior human resource manager indicated that:

> *'...the management remains flexible whilst assigning targets; they always try to be in agreement…'*
>
> *(HBLHR5)*

The success of knowledge management initiatives requires a knowledge vision, employee autonomy and knowledge creation and sharing culture. The management of a bank encourages employees to create a knowledge culture by introducing merit and competitiveness in the organisation. In terms of employee recruitment and selection, the importance was given to the recruitment of the human resource on the basis of merit. For example, the recruitment of a new generation of highly qualified

bankers on the basis of merit has completely changed the culture of the banking organisation. A regional head of the bank replied that:

> *'...well, after privatisation, the recruitment of a new generation of highly qualified bankers on the basis of merit has completely changed the culture of the organisation. This culture increased the employees' confidence in management and encouraged cooperation and trust. I can proudly say that this organisation has a very different culture and environment in which staff can learn with colleagues and seniors…'*
>
> *(NBPRH2)*

However, regarding the management policies and promoting knowledge culture, the senior manager also pointed out the plentiful challenges, resistances and government and political pressures in the banks. A senior HR head stated that:

> *'...well, you know most of the things are not so simple because people usually do not easily adapt to changes, and it is more difficult in a developing country like Pakistan. Most of the people have not accepted the changes after privatisation because they are losing their benefits in this process. To be very honest, management couldn't implement changes right away because of political and government pressures...'*
>
> *(HBLHR5)*

In spite of political and government pressure, branch managers appeared to be an appropriate person who encourage and support teamwork and keep their staff motivated. In case of Pakistani banks, senior HR head pointed out that:

> *'...branch managers are the most appropriate persons who can encourage and support teamwork and keep their staff motivated. We have a number of excellent examples in this organisation...'*

(HBLHR 5)

However, the changing business culture in Pakistani banks created a striking difference between the public and private sector organisations especially when organisations intended to implement the learning and knowledge culture. The aforesaid argument was conferred in a different way by another respondent. For instance, the regional head of the bank replied that the knowledge sharing and creation has increased with the change in the culture and structure of the organisation.

> *'...I think people share and exchange ideas only when you encourage them and provide them with a good and healthy environment in which they feel free to say anything to anyone...'*

(NBPRH2)

Summary: The findings presented above indicate that the Pakistani banks provide a supportive culture for deploying tacit knowledge through continuous social interaction in the open offices, departments, meetings, and training sessions. Bank management also supports teamwork and keeps staff motivated through employee engagement in the establishment of their goals and performance objectives. In terms of knowledge management initiatives in the Pakistani banks, the changing business culture created a striking difference between the public and private sector organisations. The present banking culture in Pakistan facilitates employees to share and exchange ideas what they think could be important to improve on things. However, the role of branch managers in terms of knowledge sharing and transfer is multifaceted in the banks that can promote knowledge sharing and transfer with the change in the culture and structure of the organisation.

6.4.3 Work Environment

The work environment permits capture and share knowledge so that the organisation may continue to progress and develop competitively. One of the generic categories that emerged during the qualitative content analysis is a work environment of the Pakistani banks. The regional head of the bank indicated that the work environment of his bank is more competitive and senior management always remained concerned to retain highly skilled staff. For example, the regional head of a bank pointed out that:

> *'...management is more concerned in retaining highly qualified people in the organisation; they are rewarded when they deserve it. A number of our junior officers achieve quick promotions on the basis of excellent performance. The management handles a strict process of perks and privileges of every employee...'*
>
> *(NBPRH2)*

The same idea was emerged in such a way:

> *'...we have implemented a system through which employee performance can be monitored and information of each employee can be collected from their department on a daily basis so that the best performers can be rewarded according to their output...'*
>
> *(MCBHR4)*

In addition to this, the banks in Pakistan are a highly paid sector and are trying to establish a work environment based on performance-based rewards and recognition. For instance, a senior human resource manager replied that:

> *'...as you know, the Pakistani banking sector is a highly paid sector and young graduates are always ready to join a banking group of good repute. The management of this organisation also takes this as*

an important threat and is continuously trying to establish a work environment based on merit and performance in order to keep employees satisfied and motivated...'

(HBLHR5)

In terms of human resource development in the Pakistani banks, a dynamic work environment, not only creates a supportive culture but also fosters strong working relationships. For example, a deputy general manager quoted that:

'...after privatisation of this bank, wide restructuring has been carried out in which more than 2,000 employees were fired from their jobs, but they only fired those employees who were either unqualified or appointed on a political basis. However, these reforms brought positive changes and helped management and employees to build a strong working relationship...'

(HBLDGM3)

In terms of learning and knowledge culture, supportive and helpful working environment also plays an important role during managing knowledge in daily activities. The information system implementation in the banks allows employees, customers and other stakeholders to collect key corporate information resources that permit systematised and customised solutions to all knowledge-related issues and problems. For example, a senior human resource manager replied that after implementation of information system, managing knowledge is much easier than before, and people come closer to each other.

'...the culture of this organisation is supportive and helpful and management is willing to promote learning and knowledge culture in the bank. We have an open office environment throughout the branches in which all banking operations are performed. Only managers have separate glass cabins but these are also open, and

employees can interact with each other at any time. Managing daily information is much easier than before. Workers come closer to each other because they can interact easily...'

(HBLHR5)

The work environment is a dominant factor that enhances socialisation and friendliness in the organisation. In the case of Pakistani banks, the regional head of the bank mentioned that the non-bureaucratic and open environment of the bank helps employees share their ideas so that they speak about the problems and obtain good suggestions and feedback from managers and colleagues. The regional head of the bank indicated that:

'...management is not in favour of more bureaucratic types of environment. Employees can share their ideas and speak about the problems and obtain good suggestions and feedback from the managers and colleagues. But this bank has the second largest network in terms of branches so there could be some problems in different branches. In some cases, branches are located in rural areas and are still dealing with many problems in terms of disputes between managers and junior staff. But, it doesn't mean that the socialisation and friendliness is not encouraged...'

(NBPRH2)

In addition, senior management believe that keeping employees motivated and rewarded is a significant challenge because most of the roles and responsibilities that involve direct customer dealings have proved to be a quite engaging and challenging for the organisation. A senior vice president pointed out that:

'...it is one of our main objectives to provide a challenging work environment to our team members. However, some individuals and departments usually get more opportunities and some individuals

are rewarded more than others but this is not common throughout the organisation...'

(MCBSVP6)

However, in spite of these notable challenges, the senior vice-president also acknowledged the positive changes in the banking environment and the strong working relationship between management and staff during performing job activities. For example, the senior vice-president quoted that:

'...banking is now completely changed and couldn't be sustained in the isolation. For routine banking operations, the lower staff is working with branch managers, and all the activities are performed with joint consultations. Employees can share anything formally and informally and managers are keeping an open mind about staff. Also, during policymaking or before launching any new product or service, the management considers what is demanded and what people have said. We also incorporate customer feedback and their opinion in assisting the bank in order to improve our services...'

(MCBSVP6)

It further pointed out that the banking organisation also implemented a mechanism through which employee performance can be monitored through employee performance evaluation system; management used to measure the difference between expected performance and actual performance. The senior vice-president suggested that:

'...we are using a transaction protocol system (TPS) for monitoring employee performance. This system monitors and collects the record of every employee and maintains an activity log of every employee on an individual basis...'

(MCBSVP6)

In addition, information received from TPS helps management to measure employee performance in terms of their learning outcomes. For example, the senior vice-president of the bank replied that:

> *'...this system lets us know exactly about our employees' performance: what they are doing; how many hours they spent in the office; and what they did during office hours etc...'*
>
> *(MCBSVP6)*

Summary: In terms of the work environment, the interviewees indicated that the work environment in Pakistani banks is supportive and helpful for managing knowledge in daily activities. On the basis of the researcher's findings, it can be concluded that the recent reforms in banking culture, structure and technology increased staff accessibility to important corporate information that permits capture and share knowledge in routine activities. More specifically, knowledge creation and sharing in Pakistani banks increased with a number of supported programmes and management tools such as challenging work environment, open office environment, joint consultation, employee performance monitoring in terms of their learning outcomes, and performance based rewards. Despite the indication of the bureaucracy in the middle hierarchy of Pakistani banks, as hinted out by few of the respondents, the overall perception grew-out that the supportive organisational and societal conditions for knowledge management initiatives (culture, structure and information technology) as a source of the knowledge creation process in the Pakistani banks. However, the role of communities of practice in the entire process found missing as none of the respondent had hinted out its role in the socialisation process of the Pakistani banks.

6.4.4 Technology Infrastructure

An accurate, accessible and useful knowledge flow requires a sophisticated information system that must be responsive and approachable. In recent years, Pakistani banks have showed more concern in getting unique systems in order to

fulfil the information needs of the employees of all cadres so that they think and act differently. The implementation of the banking knowledge management system increased employee accessibility to important information which enables them to connect with each other across the branch network within the country, thereby making data management fairly easy. The regional head of the bank quoted that:

> *'...all the information is widely shared through our information system. Every employee has access to important information. The employee can easily receive and share information on any issue at any time. The human resource department also issues a weekly newsletter in which all the latest information is circulated within the wider context of the economy, industry and organisation...'*
>
> *(NBPRH2)*

The aforesaid argument was also reinforced by a senior manager in this way:

> *'...all the information is transferred and shared through a centralised intranet system. All branches are connected and information is communicated through this system...'*
>
> *(NBPHR1)*

The IT infrastructure of the bank enables employees to meet the knowledge needs through capturing and to sharing explicit knowledge by providing shared common access to information. The qualitative interview findings indicated that a multifaceted information system of the banks in Pakistan enable employees to develop effective plans and make informed decisions. In this regard, the information system of the bank supports the activities of the management, employees, customers, and other stakeholders through effective data management system. However, every knowledge-intensive bank uses a different management information system

according to their information needs. For example, a deputy general manager stated that:

> *'...we are currently using five management information system applications such as decision support system, executive support system, management reporting system, intelligent information system and an office information system. All of these applications are integrated and are used to accomplish the organisational information management needs...'*
>
> *(HBLDGM3)*

In addition, most of the newly established Pakistani banks have either not implemented the new information management systems or their existing information management systems do not have such capacity that is usually needed for sharing large amounts of data. Despite this, the information management system in Pakistani banks is almost functioning and that indicates the long-term management strategy for promoting knowledge capture and transfer in the organisation. One of the senior human resource managers pointed out that:

> *'...the main problem is that many new established banks have developed systems over time in individual business units or divisions but their system doesn't have the capacity to share large amounts of data to different branches. But, larger banks have good knowledge management systems through which the information can be processed very quickly...'*
>
> *(NBPRH2)*

Information sharing and keeping employees updated with changing patterns influences their knowledge, skills and abilities that are required for performing tasks or activities. In other words, technology has a direct positive impact on the employee knowledge creation, sharing, and use. During one of the interviews, regional head of

the bank acknowledged that the more access to information from many sources increase workers confidence and capability.

> *'...employees are more informed, confident and capable today compared to ten or fifteen years ago. I think the only reason is that they have more access to information from different sources. The new generation that were appointed after privatisation are more competitive than those who have decades of experience in the industry...'*
>
> *(NBPRH2)*

The aforesaid argument was also endorsed in such a way that the knowledge management system creates more learning avenues for workers during performing workplace tasks and activities through knowledge sharing and transfer. The interviewee mentioned that:

> *'...people tend to learn from each other and after the implementation of the information system people have become more informed than before...'*
>
> *(MCBHR4)*

Although, the banking knowledge management system has increased employee accessibility to important information, cultural placidity and a high power distance mindset, it has made it somehow impractical to utilise knowledge in routine banking activities. In spite of that, the findings suggest that the employees in Pakistani banks are allowed to share anything at any level and can also provide a feedback directly to the head office depending on the situation and problem. The senior human resource manager replied that:

> *'...every employee receives and shares all routine information. There is no restriction from management. We also encourage a friendly environment in which people share and exchange ideas at any level*

and also communicate directly with the head office depending on the situation and problem. However, you know banks have a centralised structure with several reporting channels, therefore, in some branches there might be some problem...'

(HBLHR5)

Information sharing is also attained through communicating important information through newsletters which is a routine activity in the case of this organisation. According to the human resource manager:

'...employees are also provided with a daily newsletter in which all main events and developments are reported. Before circulating any information, it is properly evaluated...'

(HBLHR5)

The aforesaid idea was also explained by the human resource manager in this way:

'...I think the existing information system of this bank is sufficient for different knowledge management activities. However, this is not always possible. An organisation that utilises any information in any of the organisational activities on a routine basis in a banking organisation is not so easy...'

(HBLHR5)

Summary: The findings above show that the IT infrastructure of Pakistani banks has helped members to meet the information needs through capture and to share explicit knowledge. Although the members of all cadres and ranks have a free access to corporate information (databases) through the information system, the centralised structure and multiple span of controls restrains the continuous process of information sharing and transfer. In addition, the 'shared common access' to information will also smooth the progress of capturing and sharing routine information. Precisely, the use of technology in the Pakistani banking operations

permits a systematised and customised solution to most of the knowledge-related issues and problems. It further implies, however, that the human technology interface within Pakistani banks reciprocates the individual knowledge creation (cognitive system) and organisational knowledge creation (social system) mechanisms through an integrative mechanism of both processes. This also supports the basic system theory paradigm that reiterates the use of social interaction and digital technologies by which individual learning and knowledge creation can be undertaken.

6.4.5 Cultural Barrier

The abstraction process during an inductive content analysis revealed various cultural barriers to achieve the required knowledge for performing tasks or activities in the Pakistani banks. For example, a lack of adaptability was found to be a big cultural barrier that hampers knowledge creation and sharing in the organisation. A senior human resources head noted that:

> *'...in my opinion, a lack of adaptability is a big issue. A lot of people are still used to the old systems and procedures. The management can only implement a good system; if someone doesn't want to adopt this system then you cannot force it. I think people are not yet ready with this therefore they avoid adapting it...'*
>
> *(NBPHR1)*

However, the regional head of the same bank pointed out the lack of trust on the middle management which assumed to be a big cultural barrier. He argued that:

> *'...regional and branch level heads have more influence in the routine information sharing and exchange. It means that people on the top either trust them blindly or develop a system of cross monitoring. This is also a big problem because management cannot rely on the information received from regional and branch level heads...'*
>
> *(NBPRH2)*

Also, implementing changes in the Third World countries like Pakistan is a 'hard nut to crack' because most of the people do not accept changes right away. In the case of Pakistani banks, political and government involvement in the organisational change process has proved to be a big cultural barrier. The senior human resource manager replied that:

> *'...actually, most of the things are not so simple because people are not easily adaptable to changes, and this is even more difficult in the developing countries like Pakistan. Also, the management couldn't implement changes right away because of political and government involvement...'*
>
> *(HBLHR5)*

During an interview, the deputy general manager argued that the lack of command on language was found to be a big barrier in order to achieve the required knowledge for performing tasks or activities. He mentioned that

> *'...in my opinion, language is the main cultural barrier within branches located in remote areas or villages. The official language of communication, documentation and correspondence is English. Those employees who are working with branches located in remote areas or villages are not proficient in communicating in English. Therefore, a lack of command of the language may be a cultural barrier in knowledge creation, sharing and use...'*
>
> *(HBLDGM3)*

In the same vein, some junior level officers and fresh inductees are also less involved in knowledge creation and sharing because of hesitation with the senior management and unaware regarding tasks or activities. The deputy general manager suggested that:

'...at junior level, new inductees and less experienced staff also avoid sharing and exchanging information because of hesitation and being unaware of the procedures; but, with time they will improve...'

(HBLDGM3)

It is a fact that the cultural barrier is a big threat in achieving the required level of knowledge. However, the cultural tendency of knowledge accessibility and flow facilitates the process of knowledge creation, especially when people are trying to learn how to perform a task or activity. In this course, being unaware of operational procedures is considered as a big barrier for knowledge creation, sharing and use. A senior human resource officer noted that:

'...there are not too many cultural barriers when employees are trying to learn how to perform a certain task or activity. However, many employees are not aware of the many processes and activities within the bank, therefore, people are too bogged down with sorting out operational challenges for knowledge sharing. This proves to be a barrier to achieve a required knowledge...'

(MCBHR4)

In terms of societal and organisational conditions, middle management's willingness and support is seemingly required for knowledge management implementation and successful knowledge creation in Pakistani banking organisations. It is acknowledged that the middle managers are the biggest cultural barrier if they do not support effective knowledge management strategy, clear methodology, and a process in the organisation. However, in spite of different cultural barriers identified in the discussion, one of the senior human resource managers seemed fairly positive and reported that no such cultural barrier is in his organisation. It is noted that:

'...there are not too many cultural barriers when trying to learn how to perform a certain task or activity. The culture of this organisation is not to be too cut-throat. Individuals tend to be helpful to anyone

who has come into a new role; this also enables them to learn new tasks easily...'

(HBLHR5)

However, bureaucratic culture and a power distance mindset in Pakistani banking structure is still a big problem and raised questions on the management policies. It also indicates the lack of employee empowerment that restrains them from taking informed decisions and sharing ideas on important workplace issues 'on the front foot'. One of the senior vice-presidents of the bank indicated that:

'...I think bureaucratic culture is a big cultural barrier. Although most things changed after privatisation, the middle management is not happy with the changed environment. We are dealing with a few cases regarding the tug of war between rankers and highly qualified new entrants, but these are not frequent...'

(MCBSVP6)

Summary: The findings extracted from this inductive category exposed different cultural barriers to achieve the required knowledge during performing tasks or activities in the Pakistani banks. For instance, a lack of adaptability and unawareness from the associated benefits of knowledge management system weighs down the knowledge creation and sharing in the banks. Therefore, despite having a knowledge management system implementation in the Pakistani banks, the level of trust between employee and employer and a sense of ownership between employees does not support the social structures and the socialisation process through which employees can exchange their ideas, knowledge, information and feelings that considers as an important determinant of knowledge creation and sharing in the organisation.

6.5 Summary

Chapter 6 explicated the findings of the qualitative data based on six interviewees subjected to multiple levels of analysis in order to corroborate the quantitative survey

findings, and investigate the empirical relationship between organisational culture and knowledge creation process in Pakistani banks. This chapter briefly discussed the way participants were accessed, interviews were conducted and qualitative information obtained. Besides this, it summarised how and why the inductive content analysis was used for the purpose of the qualitative data analysis by explaining the specifics of the process of qualitative content analysis using Nvivo. The process of inductive content analysis begins with the organisation of the qualitative data, open coding, creating categories and abstraction. In doing so, coding was done through Nvivo to identify particular themes from the data in relation to knowledge management implementation and use in the banks. For this, an initial text was outlined on the basis of the main research objective and interview guide outlined by the researcher. The main categories consisted of the theoretical areas of knowledge strategy, work environment, management support and organisational culture, technology and cultural barrier.

In terms of knowledge strategy, the interviewees pointed out how upgrading in the technology platform helped banks to explore untapped knowledge resources through knowledge sharing and transfer of important information regarding banking policy, rules and procedures. The six interviewees also agreed on the fact that the Pakistani banks provided a supportive environment for deploying tacit knowledge through continuous social interaction in the open offices, departments, meetings, and training sessions. In this process, the 'shared common access' to information also smoothed the progress of capturing and sharing routine information, and the use of technology in the routine banking operations permitted a systematised and customised solution to most of the knowledge-related issues and problems. Despite having a suitable knowledge management system implementation in the Pakistani banks, the level of trust between the employee and the employer, and a sense of ownership between employees does not support the social structures that actually build on the communities of practices in the organisation. In spite of different cultural barriers, the supportive organisational condition e.g. knowledge management technology and societal conditions e.g. increasing competition in the banking sector after

privatisation appeared as an important determinant of knowledge creation and transfer in the Pakistani banks.

CHAPTER 7
DISCUSSION

The literature review presented in Chapter 2 discussed several research studies, including: i) research on the knowledge management in banks, and ii) the relationship between organisational culture and knowledge management. Paradoxically, the researcher couldn't find any detailed previous studies that thoroughly investigated the relationship between organisational culture and the knowledge creation process using SECI model. The aim of this chapter is to summarise the findings of this theoretically developed and empirically investigated study that was intended to examine the relationship between organisational culture and the knowledge creation process in the knowledge-intensive Pakistani banks. The discussion chapter begins with the aim and mixed-methods research questions that were deliberately included for sake of recalling the memories. Section 7.2 summarises the empirical findings based on the knowledge creation process in Pakistani banks using the SECI process. However, the last part summarises the empirical relationship between the four organisational culture values and the knowledge creation process.

7.1. Revisiting the Research Aim and Mixed-Methods Research Questions

The research methods presented in Chapter 4 outlined the research aim and mixed-method research questions. As noted, the fundamental aim of this research was to investigate how organisational culture can influence the knowledge creation process. In order to achieve the research aim**,** six research objectives (see Section 3.2.2) have been developed. However, in order to address these research objectives, one main question (i.e. how does organisational culture affect the knowledge creation process?) and two sub-questions consisting of both qualitative and quantitative research questions that have been developed, respectively.

i) RQ1: What may be the relationship between organisational culture and the knowledge creation process?

ii) RQ2: How does the senior management promote knowledge creation and sharing culture in Pakistani banks?

7.2 Knowledge Creation Process in Knowledge-Intensive Pakistani Banks

The theory testing results through the adequacy of the hypothesised factor structure using a confirmatory factor analysis is presented in the Chapter 4 (see Section 5.6); it confirmed the presence knowledge creation process in Pakistani banks. According to the findings, the SECI process (i.e. socialisation, externalisation, combination, and internalisation) performed an effective role in the knowledge creation within Pakistani banks. These findings were in agreement with the literature suggesting that the organisational knowledge creation occurs when all knowledge creation modes are 'organisationally' managed to achieve a continual cycle (Nonaka and Takeuchi, 1996).

The validation of the SECI theory in Pakistani banks indicated that knowledge creation through knowledge conversion modes is not only a Japanese phenomenon, but it can also be applicable in the developing country's organisations to some extent. These findings receive support from Von Krogh et al. (2000a); Glisby and Holden (2003) Haag et al. (2010); Andreeva and Ikhilchik (2011) which suggest that the SECI model is 'universally applicable' if the right context of knowledge sharing is provided.

The mixed-methods study findings also indicated that the post-privatisation reforms helped Pakistani banks in the implementation of the knowledge management system within banking organisations. These findings are in agreement with Nonaka and Takeuchi (1996) and Nonaka et al. (2000) that the supportive organisational culture and management's willingness to contribute to the success of the knowledge creation process facilitates knowledge sharing and a smooth process of information accessibility throughout the organisation. However, how knowledge creation process is taking place in the Pakistani banks through the four knowledge creation modes is debated in the following section based on the mixed-methods findings of this study.

7.2.1 Socialisation Process

The empirical findings indicated socialisation as a key antecedent for transfer of tacit knowledge in the Pakistani banks. Bank employees were involved in socialisation during face to face interaction, on-the-job and off-the-job trainings. About 80% of the employees stated that they try to find out others' opinions, concepts, thoughts or ideas during discussion while 81% of respondents acknowledged that they encourage others to express their concepts, thoughts or ideas. The propensity of sharing information through social interaction during performing job activities in the Pakistani banks also indicated the management's willingness and support during the transfer of tacit knowledge through formal and informal workplace socialisation activities. According to the findings, the transfer of tacit knowledge was also achieved through a steady knowledge of accessibility and flow in the banks. Over 78% of employees acknowledged that they gather information from other departments, and 77% of them share this information with their colleagues and others. However, almost 44% of employees collect work-related information and ideas during informal communication with other people.

The transfer of tacit knowledge through social interaction in the Pakistani banks also confirmed the characteristics of a collectivist society based on strong, cohesive groups and sound moral provisos (Hofstede and Hofstede, 2005). This finding gets support from Rodrigues et al. (2006) that socialisation can be achieved with conversation between people when they tend to share ideas and experiences. It implies that the workplace collectivism is a powerful enabler of knowledge sharing and exchange as it encourages cooperation and teamwork that could be significant in the knowledge creation process. This finding also supported the conviction that people are propelled through a strong interaction in which collectivism reinforces the culture of trust and loyalty and encourages socialisation in the organisation (Wang et al., 2011). Despite having significant evidence of a collectivist society and its materialisation in the Pakistani banks during social interaction and different socialisation activities, banks are comprised of a strong hierarchical organisational structure based on centralised decision making and autocratic management approach which is usually dominant in all layers of an organisational pyramid (NBPHR1,

MCBSVP6). Although the knowledge sharing and transfer during an informal dialogue is considered as an important panacea for knowledge creation, Pakistani banking culture at middle level is a high power distance in which managers retain their authority by discouraging individual interdependence thus reluctant to encourage socialisation (Hofstede and Hofstede, 2005). It indicats that the middle managers obstruct knowledge creation process because of their position at the intersecting point of the vertical and horizontal information flows within banks (Ponis et al., 2010).

In spite of reducing the number of levels in the hierarchy through downsising after privatisation, the tug of war between rankers and highly qualified employees affected the socialisation in the banks (MCBSVP6). The bureaucratic culture is still a big cultural barrier in most of the Pakistani banks as middle managers do not show their willingness in promoting knowledge creation through formal and informal discussions between employees. Although the result of the present study also indicated the evidence of the unlike cultural barriers in the Pakistani banks, there is also evidence of not too many cultural barriers when individuals are raring to go to learn how to perform a certain task or activity. For example, it quoted that individuals tend to be helpful to anyone who has come into a new role. This also enables them to learn new tasks somehow conveniently (HBLHR5). This argument indicated that the informal communication between employees is strongly supported which permits them to take ownership and responsibility of many problems when they are involved in resolving them (Denison et al., 2006).

The power distance mindset has weighed down the associated benefits of the socialisation process, Pakistani banks have implemented various on-the-job and off-the-job training programmes to enhance the knowledge sharing and transfer. These programmes appeared to be prolific for knowledge sharing and transfer through face to face discussions and dialogues with senior and junior staff from different departments and branches. It supported the sharing and exchanging of ideas and experiences taking place in face to face conversation, on-the-job and off-the-job

trainings, formal and informal meetings (Rice and Rice, 2005; Salmador and Bueno, 2007; Schulze and Hoegl, 2008; Martin-de-Castro et al., 2008).

In terms of information sharing through informal dialogue in the Pakistani banks, the structural relationship (see Section 5.12) between team orientation and four knowledge creation modes was found to be positive and significant. The result confirmed that the team-orientation supported the knowledge creation process (Nowell et al., 2009) and did typically better than individuals especially when the job is being done required more knowledge, skills and experience (Robbins and Langton, 2007). Although, junior staff in Pakistani banks learns too much during interaction with a senior manager (MCBSVP6), their 'inherited collectivism' supports them to socialise easily with others. However, bureaucratic and innovative cultures are the dominant factors in the career salience of the banking sector employees in Pakistan (Rasool et al., 2012). Thus, the benefits of knowledge sharing during interaction with senior managers and staff were not considerable. The empirical result also identified the way through which knowledge strategy indulges into the knowledge culture based on organisational learning and career growth. However, in terms of knowledge strategy, training and development was found to be substantial instruments for helping the management to build a knowledge culture and the source of knowledge creation under supportive organisational and societal conditions for knowledge management initiatives in the Pakistani banks (HBLDGM3).

7.2.2 Externalisation Process

The process for making tacit knowledge explicit is externalisation. In the organisational context, the externalisation process can be achieved through facilitating creative and constructive conversations among group members and teams. The findings of this study indicate that the tacit knowledge of staff, colleagues, and group members was converted into explicit knowledge during face to face and online conversation in the Pakistani banks. For example, the confirmatory factor analysis showed that approximately 75% of the respondents usually were able to explain their thoughts with examples when others cannot understand. Also, knowledge is made explicit through transcribing unorganised thoughts into concrete

ideas. About 74% of respondents acknowledged that they transcribed unorganised and intangible thoughts into concrete ideas during face to face dialogue with other members. Employees also transform tacit into explicit knowledge by describing technical or practical terminologies with conversational language, help others to clarify their points or ideas. Approximately, 73% of the employees agreed that they tend to describe professional or technical terms with conversational language to help communication and 40% of them use analogies when expressing abstract or (theoretical) concepts. According to the findings of this empirical study, 69% employees facilitate creative and constructive conversations among group members in which 74% help others to express what they have in mind to continue what they are saying. These findings are in agreement with Salmador and Bueno (2007) who suggested that externalisation can be achieved when people get help from technical terminologies and professional language in routine communications with each other in the organisation.

Moreover, a full retrospect of the findings regarding the externalisation process in Pakistani banks indicated that the process of converting tacit knowledge into explicit knowledge was attained through the participation of individuals in setting their operational plans, and that support was provided at the branch level depending on the willingness of the branch managers. In this connection, the major difference between the pre- and post- banking privatisation era can be assessed with the leadership encouragement and support provided to staff during the establishment of their goals and performance objectives. For example, there is evidence suggesting that the banking performance before privatisation was affected by the rigidity of a bureaucratic system and too much state intervention. Also, planning and decision making in routine activities was highly centralised and mainly done at the top level of the management structure. The managers and the employees were neither competent nor flexible in maintaining their relations with the customers. However, after privatisation the impact of leadership support can be seen in the management flexibility during assigning goals and performance objectives. It helps employees to keep their focus on their performance outcomes. It was found that the pre-privatisation reforms brought unprecedented changes in the centralised system and

some sort of operational level planning transferred at middle level. For example, after these reforms, the management showed flexibility on the agreed goals by transferring decision making to the branch level so that they could decide their objectives and operational plans (NBPHR1 and HBLHR5). During the interviews, senior managers and HR heads acknowledged that the changing structure of the banking industry in Pakistan has also changed the methodology used for assigning goals and providing team-oriented organisational culture. The significant relationship between team orientation and the four knowledge creation modes also supported this argument. For example, the hypothesis testing results (see Section 5.16) get support from Smith et al. (2005) and Collins and Smith (2006) that teamwork seemed necessary for knowledge creation particularly during the process of exchange and combination of new knowledge; the exchange and combination requires team-oriented organisational culture in which people feel free in knowledge sharing and exchange during face to face dialogue with other members.

The externalisation process was also elicited in different on-the-job and off-the-job training programmes, workshops, group discussion, customer dealing, and open workplace ambience. It found that the team orientation inculcates the dialogue during face to face communications among individuals within a group in which people share ideas and learn how to express their thinking; though instant feedback and the concurrent exchange of ideas is necessary. In the case of this study, the factor analysis findings (see Section 5.3) further implied that the Pakistani banks successfully combine and internalise explicit knowledge and create new knowledge during face to face dialogue (Kao et al., 2011). However, present information management system in Pakistani banks supports the activities of management, employees, customers and other stakeholders by accomplishing different organisational information needs (MCBSVP6). For this, a data management system is used to circulate valuable knowledge to all beneficiaries and facilitates the knowledge externalisation process fairly easy. More specifically, the knowledge management system has increased employee accessibility to important information through which they can easily receive and share information on any issue at any time. The human resource department also issues a weekly newsletter in which all

the latest information is circulated within the wider context of the economy, industry and organisation (NBPRH2 and HBLHR5). In addition to knowledge creation through informal dialogue during face to face discussion and dialogue, coordination and integration were found to be significant factors of knowledge creation (see Section 5.12) in Pakistani banks. Based on this study's result, however, the author can conclude that the exchange and combination of knowledge achieved through coordination and integration in which professional knowledge workers use knowledge resources to produce joint output from interaction of tacit and explicit knowledge (Nonaka et al., 2000; Seidler-de Alwis and Hartmann, 2008).

7.2.3 Combination Process

The combination process transformed the existing explicit knowledge that was collected from the knowledge repositories or databases into a more customised, assimilated and clearer explicit knowledge. In terms of the combination process, the present Pakistani banking system allows employees to combine different types of explicit knowledge into a clearer explicit knowledge whilst performing the job. For this, the knowledge management system in Pakistani banks currently uses a method to smooth the progress of collecting and updating new information and organising ambiguous concepts into the structure by making the connections of new and old knowledge during banking operations. For example, the confirmatory factor analysis result indicates that about 81% of employees collected new information and made connections relating to new and old knowledge. About 77% respondents were engaged in developing the criteria to determine the value of new concepts. However, knowledge combination may well be supported in a mutual environment. Group members tend to organise ideas and make conclusions, facilitate group discussions; apply experiences to help solve problems; take notes and make a summary of every meeting, event or discussion; and organise other's thoughts and opinions in their mind (Nonaka and Konno, 2005). It found that 77% of employees organised ideas and made a conclusion to facilitate the discussion in which 73% used their previous experience to help to solve problems when coming across problems; 40% have the habit of organising and making a summary of what happened after every event and 76% agreed that they organised everyone's thoughts in their mind during

discussions. These findings are same as Rice and Rice (2005), Smith et al. (2005) and Schulze and Hoegl (2008). They agreed that when individuals collect and reformulate relevant information and combine it in different activities, they create new knowledge.

The finding of this study also indicates that the knowledge-intensive bank in Pakistan uses different management information systems according to their information needs (HBLDGM3). For example, the typical knowledge management systems the banks use are different from other organisations because the spacious data flows through many channels making it a more complex process (Bowen and Ford, 2002). Therefore, in the case of the banking knowledge management system, it is confirmed that the supportive organisational conditions and the new and novel ways for the collection, sorting and transformation of knowledge stimulates exchange and combination between employees (Smith et al., 2005; Mizintseva and Gerbina, 2009). Hence, the implementation of the management information system helped banks to improve the IT platform that facilitates combining different types of explicit knowledge through the continuous updating of databases, networks and reports from different sources and then circulate them to employees in the shape of e-mails, newsletters and periodicals (NBPRH2 and HBLDGM3). This management information system and large scale databases support the activities of management, employees, customers and other stakeholders according to their information needs to some extent. These findings are consistent with Smith et al. (2005) who assert that easy accessible knowledge in an organisation directly supports the process of the new knowledge creation in terms of new products and services. In terms of combination process, it is also confirmed that the American model of managing organisations in Pakistan (Khilji, 2003) likely to support the process of applying explicit knowledge and information during performing job activities (Takeuchi and Nonaka, 2004).

Although the banking knowledge management system has increased employee accessibility to important information, cultural placidity and a high power distance mindset, it has made it somehow impractical to utilise knowledge in routine banking

activities. As mentioned in Section 6.3.3, knowledge accessibility and flow facilitates the knowledge creation process especially when people are trying to learn how to perform a task or activity**.** The cultural barrier inhibiting the knowledge creation process seemingly increases the space to achieve the required level of knowledge as most of the people become uninformed with the processes to perform their tasks and activities. The unawareness due to the knowledge gap increases the uncertainty of the task and therefore gets bogged down in the process of knowledge sharing and use (MCBHR4). This finding is parallel with Becerra-Fernandez et al. (2004) who suggest that task uncertainty reduces the knowledge externalisation and internalisation process due to constantly changing the problems and tasks.

Almost every high score of Pakistan on the power distance index indicates that Pakistan is a hierarchical society in which the autocratic management approach is usually dominant in all layers of organisational pyramids (Hofstede and Hofstede, 2005). This suggests that the high power distance in Pakistani organisations provides a strong authority for each managerial level over the lower levels, which makes each level more conservative, and this is not always possible for an organisation to utilise this knowledge in the organisation's activities on a routine basis (HBLHR5). In terms of the combination factor analysis results, they indicated that the Pakistani banking system allows employees to combine different types of explicit knowledge into a clearer explicit knowledge. However, employee involvement and participation seemed to be unmanageable, and they are hanging about the system in the hope that the system will evaluate their ideas and integrate these ideas into different organisational activities. Despite the hierarchical organisational structure, branches are required to meet their functional responsibilities. In doing so, if people face any issues they can share their opinion on important matters and suggest what they think could be done to improve or amend some policies (NBPHR1).

7.2.4 Internalisation Process

The internalisation process in knowledge creation facilitates comparing and contrasting existing and new idea (or concepts) with personal experience in order to understand its meaning. It helps personal understanding by rectifying personal

mistakes, concepts and understanding making it more eloquent and apprehensible. In the case of this study, 82% of the respondents agreed that they tend to compare new ideas or concepts with experience to help comprehend the meaning. Almost 81% of employees understand thought of others better by repeating what they said, and 77% of them asked the other person if it is necessary to repeat to make sure he/she understands exactly what they mean. In knowledge internalisation, knowledge became valuable when it is internalised in individuals through tacit knowledge bases and shared mental models or technical know-how (Nonaka et al., 2001). Over 76% of bank employees agreed that they combine existing and new concepts in a meaningful way in which 78% give others time to think about what they just discussed when communicating.

After the privatisation of the state-owned banks in Pakistan, the major focus was long-term institutional development through indulging knowledge culture based on the learning of the employees. It is found that employee training and development, higher education and career development plans, workshops and seminars appeared to be a substantial instrument for banks to build a knowledge culture and encourage employees to internalise explicit knowledge in routine activities. As a result of fierce competition between key players, the leading banks invested a huge amount on the development of human capital through employee training, higher education and career development in order to develop a cadre of skilled human resource and to work for continuous learning, adaptation and application of knowledge (HBLDGM3).

According to Nonaka and Takeuchi (1996)**,** knowledge internalisation is closely related to learning by doing. Therefore, employee training and knowledge with banking operational manuals, ethics and business practices, corporate governance and banking-related subjects provide an edge in terms of employee learning and the ability to perform a job or activity. Any professional banker has to perform multiple tasks such as dealing with corporate and personal customers, evaluating financial circumstances, managing financial requirements and providing appropriate financial advice. For this, banks will provide a pre- and post-service and a mid-career-skill

development training to staff with greater emphasis on the related and useful curriculum based on the requirements of the banking and financial sector. However, in terms of the internalisation process in Pakistani banking, staff tends to internalise newly learned knowledge as the source for next time applications in the face to face discussions, on-the-job and off-the-job trainings (Tsai and Li, 2007).

The confirmatory factor analysis finding (see Section 5.3) also validated that the internalisation activities have helped Pakistani banks to internalise explicit knowledge into tacit knowledge during the knowledge creation process. It also supported Freeze and Kulkarni (2005) that the decision on knowledge acquisition and transfer inhabits within the capabilities provided by a firm's human capital. However, in terms of internalisation, the empirical findings of this study also supports this argument that banks provide a considerable number of capability development activities through which employees can internalise explicit knowledge into tacit knowledge. For instance, the structural relationship (see Section 5.9) between capability development and four knowledge creation modes is positive and significant. This result is the same as Henderson and Cockburn (1994) and Leonard-Barton (1995) who suggested that knowledge can only be created if the capabilities determine the abilities to do things. Apart from the capability development efforts, Pakistani banks also support staff learning and development in the organisation. For instance, the structural relationship (see Section 5.9) between organisational learning and the four knowledge creation modes is positive and significant. This finding is in agreement with Alipour et al., (2011) that learning facilitates knowledge acquisition in a knowledge creation process without which new knowledge cannot be created. Therefore, it is supported by the fact that 'learning by doing' is much easier in learning organisations than non-learning organisations because they are not able to internalise explicit knowledge with tacit knowledge on a routine basis (Nonaka and Takeuchi, 1996).

7.3 Relationship between Organisational Culture and Knowledge Creation

The purpose of the study was to investigate the relationship between organisational culture and the knowledge creation process in knowledge-intensive Pakistani banks.

A quantitative and qualitative study finding (see Sections 5.2 and 6.2) revealed that organisational culture plays a critical role in the knowledge creation process of Pakistani banks. The mixed-methods study result found that the internally and externally focused banking culture facilitated knowledge creation in Pakistani banks. For instance, the internally focused culture (i.e. involvement and consistency) and the externally focused culture (i.e. adaptability) have a positive impact on the knowledge creation capability, while the relationship between organisational mission (i.e. externally focused culture) was found to be insignificant. Of the total, empowerment, team orientation, capability development, core values, coordination and integration, organisational change and organisational learning facilitates knowledge creation in the Pakistani banks. However, strategic direction, goals and objectives and organisational vision has a negative impact. The overall results showed that the organisational culture in banks affects the organisational knowledge creation process using SECI model; that means a better presence of the knowledge creation process in the Pakistani banks.

In terms of basic concept of knowledge creation and its relationship with various culture values, these findings are in agreement with previous studies (Knapp and Yu, 1999; De Long and Fahey, 2000; McDermott and O'Dell, 2001; Lee and Choi, 2003; Oliver and Kandadi, 2006; Lai and Lee, 2007; King, 2008; Kao et al., 2011; Rai, 2011; Travica, 2013). In terms of culture and its impact on the knowledge creation and the processes involved in it through use of the SECI model, these findings were categorically supported (Haag et al., 2010).

In terms of Denison's culture values, these findings are in agreement with Zheng et al.'s (2010) findings which stated that organisational culture values (adaptability, consistency, mission, and involvement) determine the way through which knowledge creation, sharing, and utilisation takes place in the organisation. These findings also get support from Li's (2013) structural equation modelling results to find the relationship between SECI modes and Denison's organisational culture indexes. The questionnaire survey data obtained from 33 bank managers in 18 Chinese commercial banks found a great and positive effect of organisational culture on

knowledge management using the SECI model. On the basis of their findings, Li (2013) posit that the different cultural traits contribute differently to SECI modes. However, Li (2013) has left the ambiguity in his empirical model while considering KM as a framework, not as a process. The overall findings of this study are discussed below in detail on the basis of the hypothesised model and comparing them with a previous research.

7.3.1 Role of Organisational Involvement

The empirical findings indicate that the two organisational involvement indexes (i.e. empowerment and team orientation) significantly impacts the SECI knowledge creation process, while the third index (i.e. capability development) partially support the knowledge creation process in the Pakistani banks. The SEM analysis provided evidence of the strong relationship between involvement culture and the four knowledge creation modes. These findings are consistent with the previous studies in the field and provided extensive evidence in terms of categorisation of the model used for measuring the impact of each culture value on the knowledge creation spiral. For example, these findings receive support from Mojibi et al. (2013) that there is a significant relationship between involvement culture and knowledge management strategy. However, Mojibi's framework was based on the relationship between involvement culture and a relation and transfer strategy and didn't actually address the knowledge creation mechanism in the organisation.

In terms of the first involvement culture index, the impact of empowerment on four knowledge creation modes were found to be significant at p-value < 0.05. The significant relationship between empowerment and the SECI knowledge creation process was based on a statistical hypothesis result of this study; however, it revealed that more psychologically empowered knowledge workers share and apply their knowledge in different situations during the performing of their job or activity (Muhammed et al., 2013). In terms of knowledge creation, it further supported that the psychological empowerment encourages the process of knowing and understanding through an internal cognition process that drives the external behavioural process which are related to knowledge creation and sharing

(Muhammed et al., 2013). This finding is consistent with Javadi and Ahmadi (2013) that the level of employee empowerment increases or decreases their engagement in knowledge management practices. Therefore, it can be concluded that the tacit and explicit knowledge can only be created when the best information is available and when employees are highly involved in their work.

The positive relationship between empowerment and the SECI knowledge creation process in Pakistani banks also points to the fact that corporate knowledge creation, sharing, transfer, and use by staff in a banking organisation environment is highly dependent on their authority to contribute ideas when work planning is taking place. As a matter of fact, bureaucratic culture and the power distance mindset in the Pakistani banking structure is still a big problem and has also raised questions on management policies. Therefore, employees in the Pakistani banks are not involved in the ongoing business planning because they have no such autonomy to implement their knowledge in achieving goals and objectives. Although banking staff is allowed to share important knowledge, the author found a lack of employee empowerment in terms of taking informed decisions on important workplace issues on their front foot (MCBSVP6). Surprisingly, in some cases, employees are not aware of many processes and activities within the bank; therefore**,** people are too bogged down with sorting out operational challenges for knowledge sharing. This proves to be a barrier to achieve the required knowledge (MCBHR4). On the basis of the researcher's findings, it can be concluded that an employee receives and shares all routine information in Pakistani banks and there are no restriction from management. Also, the environment of the banks is friendly in which people share and exchange ideas at any level while communicating directly with the head offices depending on the situation and problem (HBLHR5). But, accessibility to information alone is not valuable unless it is used for business planning, transformed into organisational knowledge or at least retained for reuse (Bogdanowicz and Bailey**,** 2002). It is, therefore, imperative that knowledge employees must be encouraged so that new knowledge is captured, and employees support one another in accomplishing routine goals through spreading out the interaction on social networks and using flexible

communication channels for uninterrupted communication with each other to share their knowledge (Mojibi et al., 2013).

The second organisational involvement index (i.e. teamwork) has a positive impact on four SECI knowledge creation modes and was also supported by the data. The researcher can strongly confirm the hypothesis (H3) which entails that the teamwork influences the four knowledge creation modes in Pakistani banks. The direct link was statistically significant; therefore, we cannot reject the existence of direct influence. Empirically, this finding was the same as Newell et al. (2009) that the knowledge creation is typically an activity that is accomplished by a team of people rather than by individuals working alone. It was further supported by Yao et al., (2007) that the human interaction increases people's awareness of tacit knowledge transfers through informal networks. We can, therefore, imply that teamwork across different parts of the bank should be encouraged by developing 'dialogue chambers' so that creative ideas can be captured, and employees are not harried with the shared knowledge to be at risk (Mojibi et al., 2013).

In the socialisation process, teamwork is used to get work done in which team members collect work-related information and ideas from other team members in a formal and informal way. Like socialisation, workplace team orientation also supports knowledge creation through externalisation. The results indicate that people in banking organisations are also involved in the knowledge creation through the externalisation process, which is a process of concept creation and is normally triggered by dialogue in a team setting (Nonaka and Takeuchi, 1996). In terms of combination and internalisation, the results of the SEM analysis indicate that the team orientation in banks has a direct influence on the performance of knowledge combination and internalisation. The empirical study findings also supported this conviction that team orientation helps members in solving the problem through managing tacit and explicit knowledge in a more organised way through management support and coordination among the various departments (Mojibi et al., 2013). This showed that team orientation is a fundamental for combining new and old knowledge, making new concepts and organising ambiguous concepts into a

structure. In other words, the process of combining knowledge into new knowledge requires team-oriented organisational culture in which people feel free in knowledge sharing and exchange (Nahapiet and Ghoshal, 1998; Collins and Smith, 2006). However, during internalisation teamwork, it helps members to compare new ideas or concepts to help comprehend the meaning.

The result indicates that the capability development has a positive impact on knowledge creation capability. The hypothesis testing (H2) result was partially supported and the empirical data reached significance. The positive relationship between capability development and SECI knowledge creation process means that the capability of performing work in the Pakistani banks is constantly improving through training, coaching, and giving employee exposure to new roles and responsibilities which enable them to translate their knowledge into organisational tacit and explicit knowledge (Smith, 2001; Zakarias et al., 2001). In other words, the current capability development practices have partially supported knowledge creation in the Pakistani banks. This finding is consistent with Freeze and Kulkarni (2005) who states that due to the recognised need for the creation and utilisation of knowledge assets, the core emphasis should be given to the organisational capability development process in order to identify and quantify the potential for effective knowledge creation, sharing and use of a firm's human capital. This can be concluded that investment in staff skill development or bench strength helps organisations to transform employee knowledge in a sustainable knowledge asset. In other words, employee capability development is also fundamental for implementing the knowledge management system because it could be useful for managing all kinds of knowledge. However, it should be a part of management policy to identify the knowledge repositories and design strategies to capitalise that knowledge (Syed-Ikhsan and Rowland, 2004).

7.3.2 Role of Organisational Consistency

In terms of organisational consistency, the mixed-methods study finding showed that the empirical relationship between core values and coordination and integration and the four knowledge creation modes was highly positive and strongly supported. At a

95% significance level, H0 is rejected for both indexes. Therefore, the researcher can confirm the relationship between consistency culture and knowledge creation in the Pakistani banks. This finding was in agreement with Mojibi et al.'s (2013) questionnaire survey findings on the Iranian oil refining company in which the researcher hypothetically confirmed the relationship between consistency culture and knowledge management strategy based on the results of the factor rankings.

Empirically, the organisational consistency index (i.e. core values**)** showed a strong positive relationship with the four SECI knowledge creation processes during the structural equation modelling analysis. The researcher can strongly confirm the hypothesis (H4) which entails that the core values influence the four knowledge creation modes. The positive relationship between the two constructs implies that there is a clear and consistent set of values and ethical code that guides staff behaviour in the Pakistani banks. More specifically, the organisational values (see Table 2.2) obtained from the value statements of the seventeen commercial banks hold employees together and guide every decision that is made in the banks (Sarros et al., 2005; Kanungo, 2006; Biloslavo and Prevodnik, 2010). The empirical evidence of this study further indicated that the internally consistent culture facilitates knowledge creation capability if management support and encourage knowledge sharing and transfer in the organisation. Accordingly, goals, values, and norms permit knowledge accessibility to key information and data which is mandatory in knowledge creation, sharing, and exchange (Von Krogh, 2000a; McDermott and O'Dell, 2001). Thus, we can infer that the 'guiding principle' or 'code of conduct' in the shape of core values also helps management in knowledge management implementation by providing a clear direction or 'perceived status' to members by taking knowledge creation as a core strategy of the organisation (Rooney and Schneider, 2005). Although this study's findings are the same as Khilji (2003), they both state that the employees in Pakistani banks are encouraged to contribute ideas, but not have authority to implement them when business planning is taking place.

In terms of the second organisational consistency index, the hypothesis (H5) testing result indicates a strong positive relationship between coordination and integration, and knowledge creation capability in Pakistani banks. According to the findings of this study, respondents from Pakistani banks are agreed on the role of the coordination and integration in employee knowledge creation capability. It is found that coordinated tasks and activities not only positively affect the performance objectives, but it also triggers workplace socialisation in which people can easily transcribe unorganised judgements into concrete ideas, collect new information, make connections of old and new knowledge and combine old and new concepts more eloquently. The easy accessibility to the information and indulgence of management in knowledge sharing and exchange not only encourages coordination and integration within all cadres of the banks, but it also improves the interaction between the management and the employees. The positive relationship between coordination and integration and SECI knowledge creation modes are supported by Du Chatenier et al. (2009) who state that the dynamic interaction of explicit and tacit knowledge in knowledge conversion processes rely heavily on the coordination and integration of knowledge workers.

The knowledge exchange and combination of intellectual capital are coordinated and integrated activities in which professional knowledge workers use knowledge resources to produce a joint output through the interaction of tacit and explicit knowledge (Nonaka et al., 2000; Seidler-de Alwis and Hartmann, 2008). The empirical evidence further supports the Hofstede and Hofstede (2005) and Khilji (2004) findings that Pakistan is a collectivist society and that Pakistani banking organisations are operating under the influence of Pakistani culture. It found that people are integrated into strong, cohesive groups. Therefore, society propels through a strong interaction in which every person takes accountability for other members of their group. Thus, it is suggested that Pakistani organisations are reflecting on qualities of national culture in which people prefer teamwork and coordinated task completion in which people prefer dialogue to solve difficult issues and they try to reach an agreement based on consensual support. The ability to resolve issues through dialogue promotes socialisation between members which is an important

factor of knowledge creation. Khilji (2003) acknowledged that most of the Pakistani banks have a high hierarchy in their organisation. Despite having a high level of hierarchy, the culture of banks is open to members to share and communicate freely. Empirical evidence indicates that there is an easy accessibility of information and people from different parts of the organisation can easily share and exchange information. Also, most of the banks have started employee communication programmes to protract the interaction between management and the employees. However, communication between management and the employees has been improved, and it is easy to coordinate projects across different parts of the banks. All employees must report to the department manager who is answerable to a branch manager; the branch manager then reports to the regional head. It is indicated that all the reporting channels are integrated with each other, and lower level employees can easily access top management for feedback on important matters.

7.3.3 Role of Organisational Adaptability

The empirical findings indicated that the relationship between organisational change and organisational learning and the four SECI knowledge creation modes is strongly supported in the Pakistani banks. The mixed-methods study findings showed that organisational tendency to adopt change and management flexibility to welcome new and improved ways to do work play a key role in the knowledge creation process. For example, the researcher found that the post-privatisation organisational change unfolded new learning avenues for the banks in Pakistan. The banking sector reforms transformed the sector into an efficient, sound and strong banking system that provided opportunities for staff to learn from the changes in the culture, structure and process of the organisation. In response to the changes in the banking environment and the prevailing threat of the global financial crisis, Pakistani banks showed more concern in changing their IT infrastructure for KM in order to fulfil information needs by capturing and sharing explicit knowledge and by providing a shared common access to all beneficiaries. The implementation of information system in the Pakistani banks supported employees to develop effective plans and make informed decisions (Wong and Aspinwall, 2006). The empirical findings, however, are the same as Maier and Remus (2003) that the technology-oriented KM

in the Pakistani banks has helped knowledge externalisation and the combination process in which tacit knowledge was converted into explicit knowledge by continually collecting work-related information and ideas from other people during face to face and online discussion. So, we can conclude that the organisational culture supports knowledge externalisation and combination if it adopts changes in the environment and is able to show flexibility.

In addition, the reforms in the basic organisational structure together with the knowledge management system development support the process of managing tacit and explicit knowledge (Anantatmula and Stankosky, 2008). It found that the privatisation of the nationalised commercial banks replaced the bureaucratic and lethargic organisational culture with the culture of professionalism and service-orientation**.** There were different initiatives in terms of knowledge management implementation and digitisation of the banking operation and this made information accessible to everyone. It further found that the organisational change also complemented the nature of the firm's knowledge structure. For example, the induction of fresh talent was based on merit**,** promotions and performance-based compensation system; it also provided a good support in increasing the knowledge capital of the banks. This result also supported the finding of Marsick and Watkins (2003) which states that changes in organisations, the changing nature of work, changes in the workforce are driving forces compelling organisations to shift to knowledge organisations.

However, the organisational adaptability and the ability to recognise and react to the environmental threats and opportunities require that the employees collect necessary information from the internal and external environment, and exchange their tacit ideas through constructive dialogue in teams. The mixed-methods study findings revealed that the organisational change in the conventional hierarchy of Pakistani banks was introduced in order to handle knowledge management issues and increase social interaction. Through this knowledge management system, the continuous process of sharing work experiences and replicating these interactions with learning by doing is fundamental through which employees can create new knowledge in

routine banking operations (Anantatmula and Stankosky, 2008). In addition, such changes in the banking organisational structure also increased employee participation in the policy making through their suggestions and what they assume could be done to improve or revise some policies (NBPHR1).

In terms of organisational learning, the empirical result also supported and it was found to be statistically significant, but the researcher cannot reject the existence of a direct positive relationship between organisational learning and the four SECI knowledge creation modes. Thus, the researcher can strongly confirm the hypothesis (H7) which entails that the organisational learning has a positive relationship with the knowledge creation process in the Pakistani banks. The respondents from banks agreed with Calantone et al. (2002) and Gonzalez (2010) that embedded systems of the learning organisations can help to capture and share knowledge so that the organisation may progress and develop competitively. This empirical finding also received the support from Davenport and Prusak (2000) that organisational learning facilitates learning and responsible for knowledge culture in the organisation through knowledge creation, sharing, and application of knowledge. The structural equation modelling result evidenced that the banking sector adaptableness in promoting learning culture through employing skilled professionals was based on merit and a substantial investment in the training and development in higher education of employees**.** These are a few post-privatisation reforms for human capital development in Pakistani banks that placed a direct positive impact on knowledge creation in the banks. It further supports Nonaka and Konno (2005) that people who are involved in learning and development use the new and existing information to improve personal knowledge, skills and abilities.

In addition, the findings of this study confirmed that the supportive and helpful working environment serve as a major factor that creates new knowledge in the organisation. It found that most of the public and private Pakistani banks have customised their policies in order to improve the working environment through teamwork, innovation, and career progression. In terms of employee learning and development, the training and development as part of the strategy for promoting

knowledge culture in the banks has also provided an opportunity to share tacit knowledge in an open office environment and thereby supports employees when they apply their knowledge in the job (Swap et al., 2001). In terms of technology, the information system implementation in the banks allows employees, customers, and other stakeholders to collect key corporate information resources and also contribute to the sharing of experiences and perspectives among the members so that tacit knowledge is converted into explicit knowledge (Alipour et al., 2011). The knowledge transfer during a two-way dialogue between employees and managers in an open office environment also indicates some sort of collectivism during the performing of a job in the banks; it also supports and encourages staff to understand what is required and how it could be achieved. However, apart from learning and development, the advent of information technology infrastructure and the implementation of multifaceted knowledge management systems in Pakistani banks have also increased employee learning and their participation in order to improve the things in some way. On the basis of the researcher's findings, it can be conclude that the organisational learning culture serves as an incubator that supports staff in terms of their intellectual development, knowledge creation and career progression.

7.3.4 Role of Organisational Mission

In terms of the three organisational mission indexes, the empirical relationship between strategic direction, goals and objectives, and vision and knowledge creation capability was found to be insignificant and negative in the Pakistani banks. The hypothesis testing result during the structural equation modelling indicated that the significance level is more than error level. The Ho in case of all three indexes cannot be rejected at 95% confidence level so the researcher cannot confirm the hypotheses (H8, H9 and H10). This result does not support Mojibi et al.'s (2013) argument that the mission culture gives a clear view of the organisation in terms of knowledge creation and transfer strategy.

In addition, the negative relationship between the strategic direction and the knowledge creation in Pakistani banks has pointed out several factors that may help to explain this unexpected result. For example, the researcher can infer that banking

staff in Pakistani banks are unclear about their goals which are either unrealistic or unmatched with organisational goals. It also indicated that the senior management either failed to convey the knowledge vision to their employees or do not pursue knowledge management as a separate corporate strategy (NBPRH2). The missing element of knowledge in the mission statements of Pakistani banks means that there is no widespread agreement about knowledge goals in the current banking knowledge strategy. For instance, mission statement elements (see Section 2.1.3) of the seventeen banks taken from the websites of each bank and compared with existing literature indicated that Pakistani banks are not developed yet. They are exploiting organisational knowledge as part of their competitive business strategy that may help organisations to link knowledge processes, technologies and organisational structure to short-term goals and objectives that may help every employee to achieve routine tasks and activities (Zack, 2002).

The empirical study result identified the way through which knowledge strategy indulged in the banking culture through performance and learning based on career growth within the case organisations. For instance, organisational learning through training and development, staff higher education, seminars, open office environment, and supportive organisational and societal conditions found to be a substantial instrument to build a knowledge culture and source of the knowledge creation in the banking firms (HBLDGM3). However, lack of distinct knowledge strategies, absence of specified knowledge goals, unclear knowledge vision, and dealing knowledge management as part of human resource strategy that support the process of managing tacit and explicit knowledge, and brought changes in the organisational culture, cultural values and employee beliefs thus far not used to obtain acclaimed benefits of knowledge creation and transfer in the Pakistani banks (NBPRH2).

In terms of mission culture, the mixed-methods study findings of this study found that the connection between knowledge management and business strategy was either ignored or overlooked in practice. The disintegration between knowledge management and business strategy implies that the present banking mission statements do not uphold the activities of organisation members with core knowledge

management systems and procedures that create and exploit knowledge. In spite of the recent technological and organisational initiatives to fulfil unique information needs of bank employees through effective knowledge management system implementation, the mission statements of the banks do not integrate into a rational practice or set of practices with mental activities, strategic activities and tacit knowledge that do not necessarily produce positive results in terms of new knowledge creation and transfer between employees (Bryson, 2011).

According to the findings of this study, corporate information is widely shared through the information system in Pakistani banks. Every employee has access to important information so they can easily receive and share information on any issue at any time. The human resources department also issues a weekly newsletter in which all the latest information is circulated within the wider context of an economy, industry and organisation (NBPRH2, HBLHR5). However, the digitisation and IT infrastructure development in the Pakistani banks is only used to meet the knowledge needs by capturing and sharing explicit knowledge and by providing shared common access to information. Therefore, the absence of knowledge vision and disintegration between the knowledge management strategy and the business strategy appeared to be counterproductive in creating any realistic human technology interface that can be used for individual knowledge creation (cognitive system) and organisational knowledge creation (social system) mechanisms through an integrative mechanism of both processes (Kimmerle et al., 2010). In other words, technology is merely applied as an enabler or a tool in the Pakistani banks while management vision seems to be indisposed in terms of individual tacit knowledge creation through human technology interface.

The social interaction may be the main source in deploying tacit knowledge using advanced knowledge management systems, information technology, knowledge base and other expert systems for the continuous process of sharing and observing life or work experiences by replicating these interactions with learning by doing (Nonaka et al., 2000). However, in the case of Pakistani banks, the top management knowledge vision was somehow reflected in the provision of shared time and space (or ‘ba’)

where new knowledge can be created and managed. For example, physical space (i.e. rooms, open offices), mental space (i.e. face to face discussions, meetings and trainings) and virtual space (i.e. IT platform, Internet and intranet) provision of the banks encourage staff to work together and facilitate informal dialogue within teams and groups before or after working hours. However, the provision of shared time and space in which individuals share workplace experiences, ideas and routine affairs through face to face contact and virtual mediums such as e-mails, memos, teleconferences, newsletters and manuals is a part of a business strategy which is required for organisational long-term survival and growth. Despite that, the Pakistani banks encourage face to face contact (e.g. human interaction) and provide a virtual space (e.g. technology interaction). There is no widespread agreement between both modes of interaction. It indicates a lack of human technology interfaces by which banks can build, maintain and utilise organisational knowledge creation.

Altogether, from the foregoing analysis throughout the mixed-methods and confirmatory factor analysis**,** results have revealed that the absence of banking knowledge strategy doesn't mean that the knowledge creation process in the banks is not supported. However, the SECI process in the Pakistani banks looked to be a realistic route through training programmes, workshops, employee involvement in deciding goals and objectives, creating communities of practice, encouraging knowledge sharing during formal and informal discussion and providing time and space for practising knowledge activities.

CHAPTER 8

CONCLUSION

The idea for this research stirred in 2010 whilst working on a research project about the role of human resources policy in employee retention in Pakistani banks. The overall perception grew out of the fact that Pakistani banks spent billions of rupees on employee learning and development but reluctant to utilise organisational knowledge in business planning to attain competitive advantage (Mizintseva and Gerbina, 2009). Hence, the researcher was motivated by the theme that 'culture and its impact on knowledge creation and the use of the SECI model will enhance the insights of an organisation into their knowledge creation and the processes involved in it' (Haag et al., 2010). The principal aim of this empirical study was formulated to investigate the relationship between organisational culture and the knowledge creation process using a SECI model of knowledge creation.

Nonaka's knowledge creation process provided a distinctive framework in management and organisation studies that broadly covers the sharing and creation process (Von Krogh et al., 2000a; Earl, 2001; Haag et al., 2010). Therefore, Nonaka's SECI knowledge creation framework was opted for regarding the item specifications in the context of knowledge-intensive Pakistani banks (Hinkin, 2005; Song et al., 2011). In spite of the 'universal applicability' of the SECI model (as acclaimed by Nonaka) in different cultural contexts, the applicability of this model for measuring knowledge creation in Pakistani banks was questionable (Glisby and Holden, 2003; Andreeva and Ikhilchik, 2011; Haag et al., 2010). Therefore, in order to provide evidence whether the SECI knowledge creation process is supported within Pakistani banks, this study opted for the SECI model for knowledge creation in the context of Pakistani banking organisational culture.

Arguably, the Pakistani banking industry is a relatively more knowledge-intensive sector than other sectors as it contains heterogeneous and pervasive knowledge capital. According to the best of the researcher's knowledge, no study has thoroughly investigated the relationship between organisational culture and the knowledge

creation process using the SECI model, and in developing countries like Pakistan, this is the first study that thoroughly covers both knowledge creation and the sharing process in knowledge-intensive banking organisations.

The research findings presented in Chapter 7 were derived from the mixed-methods empirical investigation and answered the research questions relating to the relationship between organisational culture and the knowledge creation process using the SECI model in Pakistani banks. In addressing the research questions, the researcher constructed a methodology for investigating the relationship between endogenous and exogenous variables using both quantitative and qualitative methods to substantiate the suitability of using mixed-methods in a social inquiry.

While reviewing the literature on knowledge management, knowledge creation and organisational culture, the relationship between organisational culture and knowledge management was widely acknowledged (Knapp and Yu, 1999; De Long and Fahey, 2000; McDermott and O'Dell, 2001; Oliver and Kandadi, 2006; Lai and Lee, 2007; King, 2008; Kao et al., 2011; Rai, 2011; Mueller, 2012; Travica, 2013). However, despite the recognition of the influences of culture on effective knowledge management implementation (Janz and Prasarnphanich, 2003), knowledge management practices (Alavi et al., 2006) and knowledge sharing, management and transfer (Schumann and Tittmann, 2010), the relationship between organisational culture and specific knowledge management processes was not investigated (Mueller, 2012). Therefore, based on the gap in literature, this thesis contributes to the body of literature on the relationship between organisational culture and the knowledge creation process.

This chapter will encapsulate a summary of the key study findings followed by the key research contributions. The practical implications of the study and the limitations of the research are also included before summarising the challenges of the study encountered during the whole research journey. Finally, the area of future research is summarised in the closing section.

8.1 Summary of Findings

The confirmatory factor analysis found that the all four SECI modes (i.e. socialisation, externalisation, combination, and internalisation) have an effective role in the knowledge creation process within Pakistani banks studied.

- The empirical findings indicated socialisation as a key antecedent for transfer of tacit knowledge in the Pakistani banks studied. Pakistani banks have implemented various on-the-job and off-the-job training programmes to enhance knowledge sharing and transfer. These programmes appeared to be prolific for knowledge sharing and transfer through face to face discussions and dialogues with senior and junior staff from different departments and branches. Although the knowledge sharing and transfer during informal dialogues are considered an important panacea for knowledge creation, Pakistani banking culture at the middle level is of a high power distance in which managers retain their authority that is weighed down with the associated benefits of the socialisation process.

- In terms of the externalisation process, the tacit knowledge of staff and group members is converted into explicit knowledge during face to face dialogue in their routine job with other members. The process of converting tacit knowledge into explicit knowledge was also attained through the participation of individuals in setting their operational plans and support provided for team orientation at the branch level depending on the willingness of the branch managers.

- In terms of the combination process, the present Pakistani banking system allows employees to combine different types of explicit knowledge into clearer explicit knowledge whilst performing their job. For this, the information system in the banks is currently being used to increase the knowledge accessibility by having a smooth process of collecting and updating new information for performing the job. The implementation of the management information system helps banks to improve the IT platform that

facilitates combining the different types of explicit knowledge by updating the information into their database continually.

- The confirmatory factor analysis findings validated that the internalisation process helped Pakistani banks to internalise explicit knowledge into tacit knowledge during the knowledge creation process. It found that employee training and development, higher education and career development plans, on-the-job trainings, workshops and seminars appeared to be a substantial instrument to internalise explicit knowledge in routine activities.

In terms of involvement culture, the empirical evidence enhances our understanding of the knowledge creation process in the organisations in which people create a sense of ownership and responsibility through empowerment, team orientation and capability development.

- The impact of empowerment on the knowledge creation process was found to be significant which revealed that the more psychologically empowered knowledge-workers shared and applied their knowledge in different situations whilst performing their job.

- A positive significant hypothesis result of team orientation and the knowledge creation process indicates that team orientation facilitates constructive conversation in teams during workplace socialisation which is a dominant factor in the knowledge creation process.

- The positive relationship between capability development and the SECI knowledge creation process, however, implies that the capability of performing work in the Pakistani banks is constantly improving through training, coaching, and giving employee exposure to new roles and responsibilities which enables them to translate their knowledge into organisational tacit and explicit knowledge.

In terms of consistency culture, the empirical evidence enhances our understanding of the knowledge creation process in the context of the organisation that has built an integrated system of governance based on core values, agreement, and coordination and integration.

- The core values showed a strong positive relationship with the four SECI knowledge creation process during the structural equation analysis. We can strongly confirm the hypothesis (H4) which entails that the core values influence the four knowledge creation modes. The positive relationship between the two constructs implies that there is a clear and consistent set of values and an ethical code that guides staff behaviour in the Pakistani banks.

- The hypothesis testing result indicates a strong positive relationship between coordination and integration and the knowledge creation process in Pakistani banks. According to the findings of this study, the respondents from the Pakistani banks agreed on the role of the coordination and integration in the employees' knowledge creation process. It found that coordinated tasks and activities not only affects the performance objectives positively, but it also triggers a workplace socialisation in which people can easily transcribe unorganised judgements into concrete ideas, collect new information, make connections of old and new knowledge and combine old and new concepts more eloquently.

In terms of adaptability culture, the empirical evidence enhances our understanding of the knowledge creation process in the context of the organisation that has the ability to respond to the environmental threats and opportunities through organisational change, customer focus and organisational learning.

- The positive relationship between organisational change and the SECI knowledge creation process, however, implies that the organisational tendency to adopt change and management flexibility is to welcome new and improved ways to do work**;** this plays a key role in the knowledge creation

process. The researcher found that the banking sector reforms after the privatisation transformed the sector into an efficient, sound and a strong banking system by changing their IT infrastructure for KM in order to fulfil the information needs through capturing and sharing explicit knowledge and by providing a shared common access to all beneficiaries.

- The relationship between organisational learning and the knowledge creation process in Pakistani banks was found to be statistically significant. The respondents from the banks agreed with Calantone et al. (2002) and Gonzalez (2010) that the embedded systems of the learning organisations helped to capture and share knowledge so that the organisation can progress and develop competitively. On the basis of the findings, the researcher can infer that the organisational learning culture serves as an incubator that supports staff in terms of their intellectual development, knowledge creation and career progression.

In terms of mission culture, the empirical evidence enhances our understanding of the knowledge creation process in the context of the organisations which are high performing in terms of their strategic direction, goal orientation and long-term vision.

- The negative relationship between strategic direction and the knowledge creation process indicates that the senior management of the bank either failed to convey the knowledge vision to their employees or do not pursue knowledge management as a separate corporate strategy.

- The relationship between goals and objective and the knowledge creation process in Pakistani banks was found to be statistically insignificant. It indicates that the worker in Pakistani banks is unclear about their goals which are either unrealistic or unmatched with organisational goals. It implies that there is no widespread agreement about knowledge goals in the current banking knowledge strategy.

- The negative relationship between organisational vision and the SECI knowledge creation process, however, implies that the digitisation and IT infrastructure development in the Pakistani banks was only used to meet the knowledge needs by capturing and sharing explicit knowledge and by providing a shared common access to information. The absence of knowledge vision and disintegration between the knowledge management strategy and the business strategy appeared to be counterproductive in creating any realistic human technology interface that can be used for individual knowledge creation (cognitive system) and organisational knowledge creation (social system) mechanisms through an integrative mechanism of both processes. In other words, technology has been merely applied as an enabler or a tool in the Pakistani banks while the management vision seems to be indisposed in terms of individual tacit knowledge creation through a human technology interface.

8.2 Contribution of Study

i. In terms of theoretical contribution, this thesis contributes to the body of knowledge management literature on the relationship between organisational culture and knowledge creation process based on socialisation, externalisation, combination, and internalisation. In the past, the relationship between organisational culture and specific knowledge management processes were not investigated. Therefore, based on the gap in literature, this empirical study is the first that thoroughly investigated the hypothesised relationship between organisational culture and the knowledge creation process in Pakistani banks.

ii. The precedent of the use of the SECI model for measuring knowledge creation and sharing in the Pakistani knowledge-intensive organisations in general, and Pakistani knowledge-intensive banks in particular is not present other than this empirical investigation. This study is the first that has thoroughly investigated the hypothesised relationship between organisational culture and the knowledge creation process based on socialisation,

externalisation, combination, and internalisation in Pakistani knowledge-intensive banks. The semi-structured interview findings provided evidence of the senior management's willingness and support in the knowledge management system implementation and in promoting knowledge culture in the Pakistani banks.

iii. In comparison to previous studies, this study utilises the organisational culture values that can be managed in a way to improve the knowledge creation process in the organisations. For example, instead of focusing on the organisational culture that can be managed, previous studies have mainly focused on the unwritten organisational values, norms, and procedures. Although, most of the authors have conceptually acknowledged the organisational culture in knowledge creation and management process, none had validated the relationships to support this claim. In terms of contributing to the literature, this study is the first that provides the empirical evidence of the hypothesised relationship between ten organisational culture values and the knowledge creation process in Pakistani knowledge-intensive banks

iv. Based on the theories which suggest that organisational culture and the knowledge creation process are linked, this study is the first that has thoroughly investigated the hypothesised relationship between organisational culture and the knowledge creation process in Pakistani banks based on 'internally focused' and 'externally focused' organisational culture factors. For instance, in terms of 'internally focused' culture, the hypothesis testing result of three involvement culture indexes (i.e. empowerment, team orientation and capability development**)** and two consistency culture indexes (i.e. core values and coordination and integration) have positive relationships with the knowledge creation process. The hypothesis testing result has enhanced our understanding of knowledge creation in the context of an organisation that has the ability to keep a focus on the internal integration of systems, structures, and processes through employee and customer satisfaction. However, in terms of 'externally focused' culture, the hypothesis

testing result of two adaptability culture indexes (i.e. organisational change and organisational learning) show a strong positive relationship with the knowledge creation process. However, three mission culture indexes (i.e. strategic direction, goals and objectives and vision) were negatively supported. The hypothesis testing results enhanced our understanding of the knowledge creation process in the context of organisations that keep focus on adapting and changing in response to the prevailing environmental threats and opportunities.

v. In comparison to previous studies that used Denison's organisational culture survey and the SECI knowledge creation process to explore the relationship between organisational culture and knowledge management, this study is the first that has investigated the relationship from the perspective of an individual's organisational culture dimension. For instance, previous relevant studies considered an entire organisational culture and knowledge management models for finding a corresponding relationship between both factors. However, this study is a first in the sense that it looked at the nature of both cultural value and knowledge creation process before making any inference on the relationship.

vi. The confirmatory factor analysis has provided the evidence of the latency of both knowledge creation and organisational culture constructs developed by a researcher. For example, the CFA results of both hypothesised measurement models to test the knowledge creation construct are based on the socialisation, externalisation, combination, and internalisation process. The organisational culture construct based on the involvement, consistency, adaptability, and mission showed that both constructs are consistent and adequate to measure the relationship. In terms of contribution, the lack of empirically validated scales in the context of knowledge-intensive Pakistani banks further multiplies the need of this study.

vii. The complex nature of the research problem normally requires an intense investigation. Therefore, for addressing the research questions, the researcher constructed a methodology for investigating the relationship between endogenous and exogenous variables using both quantitative and qualitative methods that will substantiate the suitability of using mixed-methods in a social enquiry. In this process, the researcher pursued a balanced philosophical standpoint as it not only substantiates the reality and significance of the natural and physical world but also recognises the importance of the social and psychological world. Although a massive amount of empirical research has been conducted on the knowledge management research in the past, there was 'no identifiable research methodology' that can serve the purpose. However, this study has contributed by way of developing an approach where objective knowledge can be gathered and measured empirically through a quantitative method and a qualitative method provides a significant aspect of subjective interpretations in relation to social phenomena through a different logic of research procedure.

viii. Despite the large amount of empirical research conducted in the field of knowledge management, there is a lack of comprehensive quantitative evidence that can be used for any conclusive analysis on the organisational culture and the knowledge creation process especially the empirical research involving the SECI model. This study has provided a comprehensive quantitative data analysis of the selected constructs of organisational culture in explaining the variance in the knowledge creation construct in terms of suitability and appropriateness of the context. Consequently, the adequacy of the hypothesised relationship is assessed through different model fit indices, such as significance of the estimated paths between hypothesised latent variables, squared multiple correlations (SMC) for strength of the hypothesised relationships, amount of variance in each endogenous latent variable, magnitude of the estimated parameters, and the measurement error of the survey data to cross-validate the quantitative analysis results.

8.3 Practical Implications

The findings of this study offer some practical implications that could help policymakers and managers to enhance the understanding of the knowledge creation process in different cultural contexts. The empirical findings on the relationship between organisational culture and knowledge creation also suggest that managers should improve the knowledge creation process through cultural change initiatives in the banks. Some of the practical implications are given as follows:

i. In terms of societal and organisational conditions, the middle management's willingness and support is required for knowledge management implementation and successful knowledge creation in Pakistani banking organisations. Pakistani banking culture at middle management is a high power distance in which middle managers are in a position to retain their authority, and discourage socialisation. Despite having significant evidence of a collectivist society and its materialisation in the Pakistani banks during social interaction and different socialisation activities, the benefits of knowledge sharing during interaction with senior managers and staff was found to be not considerable. This finding revealed the fact that the predicting role of organisational culture in knowledge management success in the Pakistani corporate sector is not overwhelming because of the lack of management interest and support. Therefore, management should encourage informal dialogue between managers and staff by providing suitable 'shared space' that could permit them to take ownership and responsibility of many involved problems so that the staff can assist in resolving them.

ii. The banks in Pakistan comprise of a strong hierarchical organisational structure based on centralised decision making and autocratic management approach which is usually dominant in all layers of an organisational pyramid. Therefore, the organisational structure should be flattened by eliminating the organisational layers for the sustainable knowledge sharing across a larger group of individuals in the banks.

iii. The bureaucratic culture is still a big cultural barrier in most of the Pakistani banks as middle managers do not show their willingness in promoting knowledge sharing through formal and informal discussions between employees. The regional and branch level heads have more influence on the routine information of sharing and exchange. It showed that the senior management has no other option rather than to trust on the information received from the middle hierarchy. The evidence of this unlike cultural barriers in the Pakistani banks, however, requires that the management should reformulate the policy and reduce the role of middle management in which they keep control of the information of their own choice.

iv. As discussed in Section 7.2.2, the cultural barrier has seemingly increased the space in achieving the required level of knowledge as most of the employees are not aware of certain processes and activities within the banks. In some cases, people are obscured in terms of their operational challenges for knowledge sharing. Therefore, senior management should increase employee involvement in different tasks through job rotation so that people get to know the processes and activities and get the advantages of job specialisation before going into a new task and assignment.

v. The employee involvement and participation during ongoing work planning is also lacking on important matters because they have no such autonomy to implement their knowledge in achieving work tasks. If any employee suggests what they think could be done to improve or amend some policies, the management amends the policy on employee feedback. But, normally, managers are hesitant to involve others in the process. Therefore, management should consider making changes by removing these barriers and allowing them to put their ideas into practice in daily work planning so that they can combine different types of explicit knowledge into clearer explicit knowledge.

vi. Given that, implementing changes in the Third World countries like Pakistan is a 'hard nut to crack' because most of the people do not accept changes right away. The lack of adaptability was found to be a big cultural barrier in the Pakistani banks. Most of the people are still used to old systems and procedures; they are not amenable with the new system and the increased use of technology. Therefore, senior management should need to enhance employee awareness with the core knowledge management systems and procedures to increase the associated benefits that create and exploit knowledge.

vii. The lack of command of language within branches located in remote areas or villages was found to be a big cultural barrier in order to achieve the required knowledge sharing, transfer, and use for performing tasks or activities. Therefore, banks should take preliminary measures in order to remove language barrier through training and face to face discussions between new staff so that learning by doing as a mechanism of internalising knowledge can be improved across the branches.

viii. The lack of a distinct knowledge management strategy, knowledge goals and organisational knowledge vision that might support the employee's beliefs for managing knowledge in a routine job is unable to provide associated benefits of knowledge management in Pakistani banks. Therefore, it can be categorically recommended that banks should clearly outline the knowledge management goals so that the working staff can take the appropriate benefit of the knowledge management process through knowledge creation, sharing and use.

ix. The absence of separate positions such as chief knowledge officer, knowledge analyst, and knowledge manager to handle knowledge management issues indicated that the knowledge management in the Pakistani banks is only limited to capturing and transferring the inter-organisational knowledge flow through the information system technology.

Therefore, it can be suggested that the banks should depute knowledge officers and establish a separate department to handle knowledge management functions in the bank.

8.4 Challenges of Study

Indeed, it seems that there has been difficulty for the researcher to arrange interviews especially in the financial sector as these organisations are often reluctant to share information. Also, getting access to senior bank managers was one of the most challenging tasks because people in the top hierarchy have very busy schedules or rare free time (Lakshman, 2009). In the case of developing countries, it is generally perceived that the researchers have to deal with enormous difficulties in getting access to targeted participants in order to conduct interviews and questionnaire survey if they have don't have any prior reference with any related personnel or someone not willing to open the doors. The researcher's three-year job experience as a financial and research analyst in the financial sector of Pakistan and previous research experience in Pakistani banking organisations undoubtedly helped to lessen the potential hindrances that might encounter during the data collection process. However, some of the challenges encountered during the research process are acknowledged in this section.

i. The first and most important challenge was to gain access and permission for the data collection. The researcher managed to gain access to the Pakistani banks by obtaining formal permission to visit three knowledge-intensive banks; the researcher received a mixed perception. Some respondents were accommodating in terms of generosity and support during the entire process of data collection. However, in some cases, the researcher faced too much difficulty especially in arranging interviews with senior managers.

ii. The low and unsteady response rate on the web-based and self-administered questionnaire survey, even with consecutive reminders, was another substantial and common challenge that the researcher faced during the data collection process.

iii. The difficulty faced during analysing quantitative data was another impediment that the researcher is supposed to acknowledge here. Although the researcher has completed similar quantitative data analysis in the past, managing different data with different specified variables was always going to be difficult for researchers using rigorous quantitative data analysis techniques and tools.

iv. Another challenge was the worsening of the law and order situation during the time of data collection in Karachi. As a result, the researcher managed to obtain only six interviews and 69 self-administered surveys in five months.

8.5 Limitations of the Study Including Lack of Representativeness and Validity of Statistical Findings

The selection of the research method is not subject to the merits and demerits of that method. Likewise, there is no such yardstick that could corroborate the suitability of any of the research methods in terms of their strengths and limitations. Therefore, such an attempt requires commitment, persistence, and a lot of rigour in order to be valid and reliable. In other words, the final selection of research process is inherently associated to the research problem and the way through which it seeks answers. The use of the mixed-methods research design was preferred to confirm the reliability and validity of the overall research findings and to 'bridge the gap between research and theory' (Creswell and Plano Clark, 2007).

Although, a massive amount of empirical research has been conducted on the knowledge management research agenda, there is no identifiable research methodology that can serve the purpose (Wallace et al., 2010). Due to no identifiable research methods and overdependence on the research methods used in the management studies, the researcher explicitly and implicitly stated the methodological stance that represent a relevance to the current trend in knowledge and knowledge management research move away from the traditional empirical

designs of business research and therefore generates an interest of its own (Creswell and Plano Clark, 2007).

In recent years, the concept of knowledge management is materialised as a separate field in academic and vocational literature. However, the current literature related to KM reveals that the research methodologies adopted in the KM related field either not known or unable to figure out the impact on the KM research (Nemani, 2009). All these factors influence the decision to employ a mixed-methods approach, which has been appearing to be a useful tool in terms of diversity, credibility and comprehensiveness by way of gathering and measuring an objective knowledge empirically through a quantitative method and subjective interpretations in relation to social phenomena through a different logic of research procedure of qualitative method.

However, in a deliberate attempt of using mixed-methods design, the researcher has not only recognised the possible limitations of the final research process but also taken certain measures to rationalise the potential limitations of mixed-methods design including lack of representativeness and validity of statistical findings. For example, the qualitative data gathered from a small number of participants i.e. six semi-structured interviews cannot be generalised to the wider community of knowledge management research. Methodologically, it does not invalidate the overall findings but the researcher can never generalise these findings with certainty to other persons, places or times that are more 'proximally similar' to this study. Therefore, the mixed-methods design was utilised to generate the external validity of the findings and provided more opportunities to make suggestions for further replication studies in other organisations.

In some cases, an unseen methodological issue readily creates major limitations to the validity. A confirmatory factor analysis (CFA) and the non-response bias estimates between paper and electronic survey responses thus used to mitigate the impact of major limitation to the validation. For this, numerous types of measures lend themselves particularly well to validity generalisation (Schmidt and Hunter,

1981). The translation validity and criterion related validity provided a validity generalisation of the statistical findings. In spite of the limitation of the final research process including lack of representativeness and validity of statistical findings, the evidence of both convergent and discriminate validity categorically support the validity of a predictor variable in one specific setting or a set of specific setting to another similar set of situations can be generalised. For example, the translation validity (i.e. face validity and content validity) provides a thorough definition of the construct in terms of method and design. In contrast, criterion related validity (i.e. convergent validity and discriminate validity) is a more relational approach to construct validity in relation to method and design based upon theory of the construct in a more predictable way.

Also, in order to increase the generalisability of the findings, a simple random sample (SRS) technique employed to choose a subset of individuals from an employee contact list received from the human resource managers of each bank rather than a non-random procedure (Leech et al., 2010). Nevertheless, the scope of this study is obviously geographically limited in that it carried out in three commercial banks located in Karachi and the surrounding area with assistance from the employees working in these banks. In spite of the innate time and cost limitation of a three years PhD funding, it provides more opportunities to make suggestions for further replication studies in a variety of geographical areas, with different people and at different times involving comprehensive longitudinal design.

The lack of response rate also create problem in terms of generalisability and statistical validity. In order to increase response rate, the researcher tried to assure that all respondents complete the questionnaire. For this purpose, the formatting of the survey questions in the typical Likert scale allows researchers to get the advantage of pre-coding and provide information that is useful for data analysis (Bryman and Bell, 2007). Therefore, a five-point Likert scale used throughout in the questionnaire, thus allow researcher to obtain more valid responses in terms of validity of statistical findings. For example, the researcher simplified the language and readability of the questionnaire in order to avoid any type of adverse events, e.g.

refusal from participation and withdraw at any stage of study. For this purpose, the survey was designed based on closed-ended (i.e. fixed-alternative) questions. These types of questions that contain a number of predetermine alternatives engages less time and easy to respond thus encourage potential respondents to complete the questionnaire properly and allow them to respond all questions (Saunders et al., 2011 and Zikmund et al., 2012).

8.6 Suggestions for Future Researchers

This study was aimed at a better explanation of how banking as an industry and Pakistan as a country is indeed a good representation of knowledge creation in different cultural settings for the audience. However, the banking industry in a single developing country may be important to that country, but how it reflects on the remainder of the world is not directly evident. This study was carried out in three commercial banks located in Karachi and the surrounding area with assistance from the employees working in these banks. Therefore, the scope of this study was limited and findings may raise some generalisability issues in terms of duplication that is generally common within experimental research (Creswell, 2009). Thus, in order to overcome generalisability issues, more work is needed based on a comprehensive longitudinal design in the future as a sequence of observations over a definite period of time will permit researchers to detect causal relationships than do experiments (Williams and Podsakoff, 1989).

The scope of this research is limited to examining the empirical relationship between organisational culture and knowledge creation only. Stated in a different way, this study aimed to imply the cultural influences on knowledge creation, but does not truly explore how the south Asian approach in terms of knowledge creation may be different. Therefore, in order to develop a comparative approach and discuss why knowledge creation is different in developed versus developing countries, cross-comparative studies need to be devised in any future study.

The knowledge creation is a complex process that needs employee undertaking, obligation, and commitment. In other words, the ‘carrier of knowledge’ is an

individual (Haag et al., 2010), therefore employee commitment could undermine the knowledge creation process. Although commitment is somehow an elusive attitude that normally bridges the gap between employee and the organisation (Jernigan et al., 2002), it would be interesting to see the influence of employee commitment on knowledge creation process in future researches.

In this study, the knowledge creation concept was thoroughly reviewed based on the relevant cited pieces in this space. However, there are many dimensions worth looking at the tacit-explicit, individual-collective, internal-external, as well as various structural and relational features. Also, apart from organisational culture, other organisational factors such as knowledge vision, organisational structure, management support, span of control may also play important roles in knowledge creation capability which calls for further attention.

In this study, the researcher has utilised only 131 cases drawn from 50 branches of three knowledge-intensive commercial banks in Karachi. Although additional work is needed, more cases may be required from more than three banks for more credible analysis. Also, this study considered the banking sector only; this implies that some of the results may not apply in other settings. Consequently, it would be interesting to conduct a similar research; for example, in another service sector organisation or other related organisations. Nevertheless, the closeness of the findings to general, theoretical predictions may be noteworthy.

For applying the confirmatory factor analysis (CFA) and structural equation modelling (SEM) using a maximum likelihood (ML) method, the sample size must be valid. For this, all the conditions were satisfied before running the CFA and SEM (see Section 5.5). However, it would be pertinent to conduct the CFA and SEM with a larger sample size for more credible results in any future research.

It is good that the researcher has validation on both the organisational culture and knowledge creation constructs in terms of contribution of this study. However, the researcher recommends these constructs to other researchers to identify how it acts

and reacts to other phenomena in the industry, in the country and other countries. Indeed, a comparison of how these CFA-validated constructs act in Pakistan versus India, or other developing countries alongside Japan or USA, etc.; it would be interesting to see.

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APPENDICES

Appendix A: Demographic, Economic and Banking Profile of Pakistan

Population

World Bank recent report 2010-11 shows that, population in Pakistan increased up to 176.74 million in 2011-12 from 173.59. Since, 2.56% Pakistani population represents world´s total population indicate that one individual out from 39 individuals is an inhabitant of Pakistan. Accordingly, 67.5 million people lived in urban areas. It shows 3.25% increase from 2010 to 2011. The recent increasing trend in urbanisation means that, Pakistan's growth is now conjoint with the development of cities and urban areas.

Labor Force & Rate of Employment

According to the Labor Force Survey, Pakistan shows 0.9 million increase in the labor force as compared to 57.2 million in 2010-11. Sector wise breakup of year 2010-11 indicates that, 13.7% people are employed in manufacturing sector, 63.2% in the agricultural sector, whereas; rest of the labor force employed in the service sector. The overall employment during 2010-11 remained 53.8 million indicates 0.6 million increase in one year.

Economy

The estimated GDP growth for 2011-12 has been reported 3.7%. It shows 0.7% increase against last year. As per previous year 2010-11, agriculture sector maintained a growth of 3.1%. It shows 0.7% percent increase against last year. The manufacturing sector showed 1.1% growth for year 2011-12 as compared to 1.0%. However, services sector contributed 4.0% to the total GDP. Due to the non-stop domestic and external stuns from 2007 such as, torrential rains, law and order situation, war against terrorism, enduring energy deficiency and upsurge in export bill increased multifaceted challenges on external and internal fronts. Likewise, current global financial slump diminishes the overall coverage to international finance.

Banking and Financial Institutions

As of December 31, 2010 there are 28 domestic and 6 foreign commercial banks along with 4 specialised banks (SBP Quarterly, 2010). The Pakistani banking industry has undergone various reforms during last one decade which includes rationalising of branches and rightsizing in terms of employees. The privatisation of state owned banks further helped to improve the I.T. platform and Human resource of these banks. Strong competition demanded improvement in customer services standards. Due to the two successive golden handshakes in 1999 and 2002 created a skill gap in all the large banks and they all employed fresh talent to fill in the gap. The new talent was more academically qualified and modern in their approach. Banking prior to these reforms was more of a male oriented industry with less than 3% shares for female workers. Post golden handshake period the most conservative banks also employed more female staff workers especially in areas of relationship banking and counter staff. They realised the persuasive power of female to land in more business. Today, most of the foreign and private banks in Pakistan have dress codes for their employees and give weight-age to the employee's appearance in the annual appraisal. In recent years, Pakistan banking sector is experiencing a high level of competition especially post privatisation scenario harbingers numerous competitiveness and growth factors between key players (Jamal and Kamal, 2003). Despite having these confronts, role of Pakistan's banking sector in micro and macro economic development of the country remained outstanding (SBP, 2002). It has 67.8% share within the total assets of the financial system and contributes 30 percent to the stock market capitalization. Overall banking sector provided employment to 117,856 persons and offered financial services to 26.6 million population. The whole numbers of banks are paying a median PKR 39.5 billion annual tax to Government of Pakistan and capital of banks has grown to USD 3.2 billion in FY 2009-10 (SBP Annual Report, 2009-2010 Volume-II).

Contribution of Service Sector in GDP Growth

The significance of the services sector has been widely acknowledged worldwide. This sector considered as engine of economy and appears as the foremost driver of

economic growth. The Pakistani service sector also plays an unprecedented role in sustainable economic growth. In recent years, a major paradigm shift has been instigated through transformation in the overall economic structure. Pakistan services sector holds 53.5% share in the GDP growth during year 2011-12. However, this percentage is significantly low as compared to the GDP share of most of the developed countries which is almost 75%. Furthermore, the breakup of Pakistani service sector indicates that, finance and insurance sector hold 6.5%, retail, and wholesale companies hold 3.6% and social or community services hold 6.8% share.

Culture of Public Sector Organisations

Pakistan after its independence from British ruled India had a vast public sector that was marked by passive management culture borrowed from the British colonial era. The culture of public sector organisations has been identified as a replica of the colonial era: bureaucratic, centralised and non responsive to customer need. Since the inception of Pakistan, foreign investment has been encouraged. This resulted in many multinational organisations investing in Pakistan. At present, a substantial number of multinationals are contributing towards the development of the country and skills transfer. The private ownership had an effect on the work culture of organisations. A corporate culture was introduced in 1997 by appointment of professionals tasked to change the culture by making it meritocratic, decentralised and responsive to employee need. In Pakistani organisations, employees are encouraged to contribute ideas, but not given the autonomy to implement them. The decision-making power resides in the top management. Little faith is placed in the intelligence of employees and employees distrust management's promises because of rarely being implemented. An upbringing that requires respects for authority leads to formal and hierarchical structures. Experience workers are reluctant to share expertise and knowledge to train new entrants. Biases in the HR policies of training and reward affect cooperation in the work environment. However, organisations in Pakistan are undergoing dramatic changes because of globalisation and influence of American management practices coupled with government initiatives to develop corporate culture.

Appendix B: Questionnaire

Relationship between Organisational Culture and Knowledge Creation Process

Dear Participant,
I thank you for taking your time to respond to the following questionnaire. This survey asks for your opinion on organisational culture and knowledge creation process within your organisation. If you agree to participate in the study than, fill out this questionnaire to help the researcher in completing PhD dissertation. It may take 15-20 minutes to complete. Please answer all questions since, each is important. This research has 'Ethical Approval'. Your responses will be held confidential and complete anonymity is guaranteed. Make sure you are connected to internet and click the "submit" button below to send your response. Thanks in anticipation.
*Required

1. Personal/Categorical Data

I. Highest degree i possess

- [ ] Doctorate
- [ ] Masters Degree
- [ ] Graduate Degree
- [ ] Undergraduate Degree
- [ ] High School / Technical Training Diploma
- [ ] Other

II. My job rank is

- [ ] General Manager/Deputy General Manager
- [ ] Senior Manager/Manager/Assistant Manager
- [ ] Executive/Officer
- [ ] Non Management/Clerical Staff/Typist/Cashier
- [ ] Other

III. The major function of my job is

- [ ] Retail Banking
- [ ] Consumer Banking
- [ ] Corporate & Investment Banking
- [ ] Islamic Banking
- [ ] Risk Management
- [ ] Financial Control
- [ ] Global Operations [Compliance/Management]
- [ ] Human Resouce
- [ ] Information Technology & System
- [ ] Learning & Development
- [ ] Marketing & Brand Management
- [ ] Legal & Corporate Affairs

IV. Length of service with my current employer is

- [ ] Under 1 year
- [ ] 1 ~ 2 years
- [ ] 2 ~ 3 years
- [ ] 3 ~ 5 years
- [ ] Over 5 years

V. Number of trainings I received in last 3 years

- [ ] 0
- [ ] 1
- [ ] 2
- [ ] 3+

VI. I understand organizational Knowledge Creation phenomenon *

Knowledge Creation is a continuous process through which one overcomes the individual limitations and restrictions imposed by prevailing information and past experience by attaining a new perspective, a new observation of the environment and new knowledge.

- [ ] Yes
- [ ] No
- [ ] Unsure
- [ ] Other:

2. Organisational Culture - Involvement

List below there is a set of statements that represents about the various dimensions of "Organisational Culture" as well as its antecedents and outcomes. Consider your understanding and experiences in your organisation, please indicate your degree of agreement or disagreement with each statement, on 5-point Likert scale anchored by 1 = "strongly disagree" and 5 = "strongly agree".

2.1. Empowerment

Most employees are highly involved in their work

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Decisions are usually made at the level where the best information is available

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Information is widely shared so that everyone can get the information he or she needs when it's needed

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Everyone believes that he or she can have a positive impact

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Business planning is ongoing and our manager involves everyone in the process to some degree

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

2.2. Team Orientation

Cooperation across different parts of the bank is highly encouraged

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

In my bank staff work like they are part of a team

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Teamwork is used to get work done rather than hierarchy

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Teams are our primary building blocks

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Work is organised so that each person can see the relationship between his or her job and the goals of the organisation

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

2.3. Capability Development

Authority is delegated so that staff can act their own

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

The capability of performing my work is constantly improving

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

There is a continous investment in the skills of employees

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

The capabilities of the staff are viewed as an important source of competitive advantage

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Problems often arise because we do not have the necessary skills to do our routine work

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

3. Organisational Culture - Consistency

3.1. Core Values

The senior management of the bank "practice what they preach"

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

There is a different management styles and practices

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Ignoring core values will get you in trouble

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

There is a clear and consistent set of values that governs the way we do our job

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

There is an ethical code that guides our behaviour and tells us right from wrong

	1	2	3	4	5	

3.2. Agreement

When disagreement occurs, we work hard to achieve "win-win" solution

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

There is a friendly corporate culture

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

It is easy to reach consensus, even on difficult issues

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

We often have trouble reaching agreement on key issues

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

There is a clear agreement about the right way and the wrong way to do things

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

3.3. Coordination and Integration

Our approach to do routine work is very consistent and usual

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

People from different parts of the bank share a common point of view

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

It is easy to coordinate activities across different parts of the bank

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Working with someone from another part of this bank is like working with someone from a different bank

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

There is good alignment of goals across levels

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

3.3. Coordination and Integration

Our approach to do routine work is very consistent and usual

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

People from different parts of the bank share a common point of view

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

It is easy to coordinate activities across different parts of the bank

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Working with someone from another part of this bank is like working with someone from a different bank

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

There is good alignment of goals across levels

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

4. Organisational Culture - Adaptability

4.1. Creating Change

The way things are done is very flexible and easy to change

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

We respond well to competitors and other changes in the business environment

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

New and improved ways to do work are continually adopted

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Attempts to create change usually meet with resistance

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Different parts of the bank often cooperate to create change

	1	2	3	4	5	

4.2. Customer Focus

Customer comments and recommendations often lead to changes

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Customer input directly influences our decisions

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

All members have a deep understanding of customer wants and needs

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

The interests of the customer often get ignored in our decisions

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

We encourage direct contact with customers by our people

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

4.3. Organisational Learning

We view failure as an opportunity for learning and improvement

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Innovation and risk taking are encouraged and rewarded by management

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Lots of things are neglected or often overlooked

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Learning is an important objective in our day-to-day work

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

We make certain that the "right hand knows what the left hand is doing"

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

5. Organisational Culture - Mission

5.1. Strategic Direction & Intent

There is a long-term knowledge strategy

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

The knowledge strategy of this bank leads other banks to change the way they compete in the sector

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

There is a clear mission that gives meaning and direction to our work

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Bank has a clear strategy for the future

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Our strategic direction is unclear to me

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

5.2. Goals & Objectives

There is widespread agreement about goals

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Management set goals that are ambitious, but realistic

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

The management has "gone on record" about the objectives we are trying to meet

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

We continuously track our progress against our stated goals

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

People understand what needs to be done for us to succeed in the long run

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

5.3. Vision

Bank has a shared vision of what the bank like to be in the future

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Our bank is knowledge bank

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Senior management is clear about long-term knowledge vision

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Short-term thinking often compromises our long-term vision

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

The vision statement of this bank creates excitement and motivation for employees

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

6. Knowledge Creation Process

List below there is a set of statements that represents about the various dimensions of "Knowledge Creation Process" as well as its antecedents and outcomes. Consider your understanding and experiences in your organisation. Please indicate your degree of agreement or disagreement with each statement, on 5-point Likert scale anchored by 1 = "strongly disagree" and 5 = "strongly agree"

6.1. Socialisation

During discussion, I try to find out others' opinions, concepts, thoughts or ideas

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

During discussion, I often encourage others to express their concepts, thoughts or ideas

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

My collegues and I will actively share life or work experience with each other

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

I gather information from other departments

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Before discussion, I will collect necessary information and show it to my collegues

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

I like to get to know the people whom I will work with before going into a project together

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Our team collects work-related information and ideas from (in) formal relationships with other people

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

6.2. Externalisation

When others can't understand me, I am usually able to give him/her examples to help explaining

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Most of the time, I can transcribe some of the unorganized thoughts into concrete ideas

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

I tend to describe professional or technical terms with conversational language to help communication

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

I tend to use analogy when expressing abstract or (theoretical) concepts

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

I will help others to clearly expressing what he/she has in mind by encouraging them to continue what they are saying

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Our team develops new ideas through constructive dialogue by using figures and diagrams

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

I facilitate creative and constructive conversation among group members

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

6.3. Combination

During the discussion, I tend to help organise ideas and make conclusion to facilitate the discussion

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

When coming across problems, I tend to use my experience to help solving problems

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

After every event, I have the habit of organising and making summary of what happened

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

During discussion, I will organize everyone's thoughts in my mind

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

I like to collect new information, and making connection of new and old knowledge to work up new concepts

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

I engage in developing criteria to determine the value of new concepts

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Our team conducts experiments and shares the newly developed concepts with the entire organisation to evaluate the value of the concepts

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

6.4. Internalisation

After hearing a new idea or concept, I tend to compare it with my experience to help me comprehend the meaning

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

I understand others' thoughts better by repeating what they said and asking them "Is this what you mean?"

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

I will tell others what I think to make sure my understanding is the same as theirs

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

When I have finished saying something, I will ask the other person if it is necessary to repeat to make sure he/she understands exactly what I mean

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Our team-members use newly learned knowledge as the sources for the next time applications

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

When communicating with others, I will give others time to think about what we just discussed

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

We combine existing and new concepts in meaningful ways

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Please use below box to write your comments/suggestions if any

Submit

Appendix C: Letter from the Director of Studies

Queen Margaret University
EDINBURGH

Division of Business, Enterprise and Management
Queen Margaret University
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9 April 2012

To Whom it May Concern

Salman Memon is a postgraduate research student at Queen Margaret University in Edinburgh, currently studying for a degree of Doctor of Philosophy.

I would very much welcome your support to allow him to collect data for this piece of research.

Best wishes

Dr Claire Seaman
Division of Business, Enterprise and Management
Queen Margaret University
Edinburgh EH21 6UU
UK

Appendix D: Approach Letter for Data Collection

Division of Business, Enterprise and Management
Queen Margaret University
Queen Margaret University Drive
Musselburgh, East Lothian
EH21 6UU

15 May 2012

[redacted]

Dear Sir/Madam,

My name is Salman Memon, and I am a postgraduate student at Division of Business, Enterprise and Management at Queen Margaret University, Edinburgh U.K. As a part of my Doctor of Philosophy (PhD) degree, I am undertaking a research project for PhD dissertation. The title of my project is: An investigation of the relationship between organisational culture and knowledge creation process: An empirical study of the commercial banks in Karachi.

The purpose of this research is to investigate if a relationship exists between organisational culture and knowledge creation process. The implications of this study can be of significant value for the banking organisations as they prepare to implement knowledge management system by leveraging knowledge culture. The findings of this study could help senior management in order to revisit the knowledge creation and sharing culture in the banks which is important for gaining competitive advantage in a knowledge economy.

This research has been granted an ethical approval from Queen Margaret University, Edinburgh, U.K. However, the proposed research is not concerned with any personal and sensitive issues and all ethical research standards and procedures will strictly be followed.

In terms of confidentiality, all the responses will be held in strict confidence and complete anonymity is guaranteed. For this purpose, names of the respondents will be replaced with a participant number, and it will not be possible to identify the data to be gathered. In order to increase the confidentiality during the duration of data retention, principal researcher will

store all relevant material, for example, email contact lists, paper and electronic surveys, interviews tape recordings and other material securely on password protected email inbox and safe storage respectively. Additionally, electronic survey will be used to invite prospective respondents to browse HTML link and complete the questionnaire, through this it would not possible for any third party to access to respondents' information, and they can be rest assured that their filled-in questionnaires couldn't be identified.

It is also worth mentioning to inform that the researcher is intended to initiate the electronic survey from June 2012 and for that purpose I also required an email contact list of the bank employees of your bank working in the Karachi region. However, the papers based self-administered survey and interviews will be conducted between the months of December 2012 to March 2013 during personal visit of the researcher. The interviews will be conducted face to face from the senior management and human resource heads.

An official survey permission letter from Director of Study of this project is also attached herewith. However, you can see the contents of an electronic questionnaire survey by browsing the following link as it would assist you to understand the scope of intended research area and the extent of required information.

https://docs.google.com/spreadsheet/viewform?formkey=dEd6QUJDZDBSOGR2QllxZTBrbC1velE6MQ

In light of above information, I would like you to grant me an official permission for data collection in your bank in a good faith of promoting research and knowledge culture in the country, sector, and organisation.

With Best Regards,

Salman Memon
PhD Student
Division of Business, Enterprise and Management,
Queen Margaret University,
Musselburgh, East Lothian,
EH21 6UU
Email: smemon@qmu.ac.uk
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Appendix E: Information Sheet for Participants

Dear Sir/Madam

My name is Salman Memon, and I am a PhD student, Division of Business, Enterprise and Management at Queen Margaret University in Edinburgh. As a part of my PhD degree, I am undertaking a research project for my PhD dissertation. The title of my project is: Relationship between organisational culture and knowledge creation process in knowledge intensive banks.

The purpose of this research is to investigate if a relationship exists between organisational culture and knowledge creation process. The implications of this study can be of significant value to an organisation as they prepare to implement knowledge management by leveraging knowledge culture. The findings of this study could help senior management in order to revisit the knowledge creation and sharing culture in the banks which is important for gaining competitive advantage in a knowledge economy.

The questionnaire survey asks your judgment and there is no right or wrong answer. Sometimes, people are enticed to answer the survey questions in the way that they think others, especially management, expected of them. Please, respond based on your own judgment, regardless of whether what you think or what is socially acceptable.

This research uses all ethical research standards and procedures. Your responses will be held in strict confidence and complete anonymity is guaranteed. You will be free to withdraw from the study at any stage, and you would not have to give a reason.

The results may be published in a journal or presented at a conference.

If you read and understand the information provided above and agree to participate in this study then please browse following link and fill out an electronic questionnaire to help the researcher in completing PhD dissertation. It may take 15-20 minutes to complete. Please, answer all questions since each is important. Make sure you are connected to internet and click the "**submit**" button at the end of the questionnaire to send your response.

https://docs.google.com/spreadsheet/viewform?formkey=dEd6QUJDZDBSOGR2QllxZTBrbC1velE6MQ

I would like to thank you for your participation. Your answers are of the greatest importance to the success of this study.

Sincerely,

Salman Memon
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